# The Builder.

VOL. LXXII. No. 2819. FEBRUARY 13, 1897.


## ILLUSTRATIONS.


Main Entrance Gates, Sheffield Municipal Buildings. Designed by Mr. E. W. Mountford, F.R.I.B.A., and executed by Messrs. Singer & Co. ..... *Double-Page Ink-Photo.*

Premises, Duke-street, Grosvenor-square, W. Mr. W. D. Caroë, F.R.I.B.A., Architect ..... *Double-Page Ink-Photo.*

Design for Chapel, Berkhamsted School. Messrs. Batterbury & Huxley, Architects ..... *Double-Page Photo-Litho.*

House, Headingley, Leeds. Mr. F. W. Bedford, A.R.I.B.A. Architect ..... *Single-Page Tone-Block.*

Wordsworth Building, Lady Margaret Hall, Oxford. Mr. R. T. Blomfield, Architect ..... *Single-Page Tone-Block.*


*Blocks in Text.*


King and Architect: from a thirteenth century drawing ..... Page 143

Wordsworth Buildings, Lady Margaret Hall, Oxford.—Plan ..... „ 149

New Premises, Duke-street, Grosvenor-square, Plan ..... Page 148

Houses, Headingley, Leeds.—Plan ..... „ 148


## CONTENTS.


'tained Glass as a Modern Art ..... 137
Notes ..... 139
The Advancement of Architecture ..... 141
The Architectural Association ..... 143
Magazines and Reviews ..... 147
Archæological Societies ..... 148
Gates, Sheffield Municipal Buildings ..... 148
New Premises, Duke-street, Grosvenor-square ..... 148
Design for Chapel, Berkhamsted School, Herts ..... 149
Wordsworth Buildings, Lady Margaret Hall, Oxford ..... 149
Nos. 2 and 3, Shireoak-road, Headingley, Leeds ..... 149
The Architectural Association Spring Visits ..... 149
Competitions ..... 149
Architectural Societies ..... 149
Engineering Societies ..... 151
The Dwelling House ..... 151
The Clerks of Works' Association: Annual Dinner ..... 151
Sanitary Inspectors' Association ..... 152
The London County Council ..... 152
The London County Council Inquiry ..... 153
London Water Supply ..... 154
"Expert Evidence" ..... 154
The Student's Column: Specifications.—VII. ..... 154
Obituary ..... 154
General Building News ..... 155
Sanitary and Engineering News ..... 155
Electric Lighting News ..... 155
Foreign ..... 156
Miscellaneous ..... 156
Capital and Labour ..... 156
Legal ..... 156
Meetings ..... 157
Recent Patents ..... 157
Some Recent Sales of Property ..... 158
Prices Current of Materials ..... 159
Tenders ..... 159


### *Stained Glass as a Modern Art.*

MODERN works on the art of stained glass have hitherto almost invariably, in this country, been mainly occupied with the art in its archæological or historical aspect. Just as painting is pre-eminently the art of the Renaissance, so stained glass is pre-eminently the art of the Mediæval period; it arose, developed, and declined as a decorative adjunct of mediæval buildings; it was finally lost entirely as an art of modern practice, and attention was only seriously turned to it again with the mediæval revival; and until quite lately it was followed, both in theory and practice, almost entirely on mediæval lines. It is only within the last few years that we have awakened to the perception that with this art, as with architecture, the mere imitation of mediæval precedent can produce but a dead and not a living form of art. And even with this perception, the emancipation of this decorative art from the bonds of precedent has come about much more slowly than is the case with the mother art of architecture; if indeed it can be said to have been fairly achieved as yet. The bulk of the stained glass produced in this country is still for the most part designed on mediæval models; the designs in which there is an attempt at infusing a modern spirit into the work are comparatively few and exceptional; and the illustrative books on the subject, some of them voluminous and valuable in their way, are still mainly occupied with mediæval history and mediæval examples; and thus, as far as their influence goes, tend to keep up this mediæval view of the subject.

The practice, however, of a few able artists seems at last to promise a breaking up of the old revival school, and the great agent in this emancipation is the study of the figure as the leading element in stained glass design. It was the neglect of figure-study in connexion with this form of art which, more than any other cause, operated in keeping us bound to an archæological manner. It was assumed that the stiff, timidly drawn, and apparently conventional figures of the mediæval artists represented somehow a style which was peculiarly suited to stained glass; whereas in fact the artists who designed the mediæval windows were not essentially figure draughtsmen, and merely drew the figure as well as they were able, and in the same way as they would have drawn it in a painting, making a little allowance for the more rigid and limited possibilities of representation in glass. This has indeed been said over and over again, but it has been hitherto but little acted on. Recently, however, artists like Mr. Richmond, Mr. Holiday, and Mr. Whall have shown practically that the free study of the figure from nature is as applicable to stained glass as to the almost equally conventional arts of fresco and bas-relief; and with that practical demonstration the mediævalising theory goes overboard at once. The predominance of figure-study for modern glass promises us a double emancipation. It overthrows the mediæval precedent, and at the same time it overthrows the system of the production of stained glass as a mere trade. The imitative production of windows in the style of the fourteenth or fifteenth centuries can be carried out, as it usually is, by a firm with a body of nameless trained artisans in its employ. For the design of glass in which the figure, as studied and employed in modern art, forms the principal element, the individual artist must be reckoned with. The actual putting together of the materials, as in mosaic, may be the work of subordinate hands; the design must be as much the work of an original artist as any other form of pictorial design.

The appearance of an important work on stained glass in which almost the whole of the illustrations are those of modern and not of ancient glass* is, at this juncture, both appropriate and significant. Mr. Holiday's illustrations in the body of the work are, in fact, taken entirely from his own designs, for which he makes a partial and intelligible apology, to the effect that it was more easy thus to illustrate his own remarks, as he could lay hand at once on whatever design would specially illustrate any one point; that they naturally illustrate his own views best; and that in taking the works of other artists he might unintentionally read into them something which the authors had not intended. He gives, however, as additional illustrations, several designs by Sir E. Burne-Jones and Mr. Richmond. The book is divided into three main sections: I. "Material and Technique;" II. "Artistic possibilities inherent in stained glass from the point of view of technique;" III. "Artistic possibilities of stained glass, considered in relation to the situation and purpose of the work." In regard to the first section we need only remark here that the materials and processes are very clearly though briefly described; that the author disapproves of thick or wide leading, which he considers an error in modern glass—a matter which however (as he partially admits) depends to some extent on situation and distance from the eye; and that he gives some special and detailed reasons against a realistic style in stained glass, which may be recommended to the attention of those who require any reasons on such a point. But our interest here is more with the second and third sections of the work, and with some of the critical points discussed in them.

In speaking of the "artistic possibilities" of design in stained glass, Mr. Holiday sets out with the perfectly sound position that the design has to be subordinate to the architectural forms which it should adorn, and therefore condemns all designs for windows of more than one light which ignore the dividing mullions or other stonework between the lights, making the stonework appear an interruption to the design instead of one of its governing conditions. Of the truth of this principle we are so convinced that we are not disposed to allow Mr. Holiday the exceptions which he makes in his own favour, in the case for instance of the window in the Church of the Incarnation at New York (fig. 17 in the book) where the couch on which Jacob blessing his children is seated runs through two lights, and that of the boat in "Christ stilling the tempest" (fig. 18), which runs through three lights. Mr. Holiday argues that the continuity of the background in these designs "has no more tendency to make the mullion appear to be an interruption than does the continuity of the panels of ornament and architectural features in fig. 15." We turn to fig. 15, and find that this is a five-light window in which the portions above and

* "Stained Glass as an Art." By Henry Holiday. London; Macmillan & Co.: New York; the Macmillan Company: 1896.

below the figures are occupied by ornamental designs, all on the same line and of the same character, no doubt, but each of which is a separate design in itself. The author has thrown over his own principle here, and given a very illogical excuse for doing so. When he says that a subject containing many figures may be extended over a mullioned window, provided that the groups of figures in each light, though with a general relation to the whole composition, have a more close and special relation to each other, so that they form a sub-composition within their own compartment, we quite agree with him; and some of the examples which he gives of this method of treatment are admirable and convincing as far as the figures are concerned. But as soon as you attempt to introduce a common background, extending behind the groups of figures and ignoring the mullions, however subordinate this background may be, you have given up the principle and introduced an anomaly in design; and we prefer Mr. Holiday's decisive words on one page to his ingenious exceptions on other pages.

And the fact is that this restriction, rigidly adhered to, is a most wholesome one, for it tends to keep the designer from straying beyond the proper limits of stained glass art. Above all other forms of decorative art, perhaps, in which figures are introduced, stained glass is essentially the art for symbolism rather than for representation. If it is urged that, under these restrictions, it becomes impossible to put a background at all into a figure composition extending through several lights of a window, we should reply—"So much the better." Backgrounds are a snare, as soon as they begin to represent anything real. You cannot indicate a landscape, in however conventional a manner, without dropping nearer to realism than stained glass will bear, if you are to make the landscape recognisable at all. And then there is the question of plane, too. Mr. Holiday says, "A distant mountain often looks blue. Why should I not represent it by a piece of blue glass?" To which we reply—What have you to do with representing a distant mountain at all in a stained-glass window? It is a thing that has no business there. Your blue glass mountain implies a distance plane behind the plane of the figures; it implies the representation both of aërial and linear perspective. We have nothing to do with either in stained glass: we are treating the transparent plane of the window-surface in a decorative manner by means of line and colour; what have we to do with suggesting another plane far beyond it? That is all right in a picture, because it is intended that a picture should produce a perspective illusion; we look *into* it; but we look *on to* a window-glass. Mr. Holiday on the same page makes what seems to us the equally curious suggestion that "a distant figure looks smaller than a real one. If the suggestion of distance is in some degree essential in a subject, by all means make the remote figures small. There is no fear of their *looking* on a different plane, the quality of the colour and the lead lines round each will preclude this. The spectator will *infer* difference from the difference of scale: there will be no illusion to the eye." No, there certainly will not; but will there not be a somewhat ludicrous contradiction to the eye, and to the mind also? And what a very curious mode to take to lead the spectator to "infer" something which, after all, he ought not to infer. We press this point strongly because we feel that there can be no true school of stained glass design, no right æsthetic of stained glass, without the full recognition of the fact that stained glass is the medium for symbolic design, in figure and ornament, *in one plane*, and that a stained glass artist has no business to be coquetting with distances and landscapes and "blue mountains" and little bits of perspective merely because they fill up conveniently some spaces in his design. That is why we approve very much of Mr. Whall's stained glass designs, as far as we have seen them; he is purely symbolic; that is why we think Mr. Richmond's clearstory windows for St. Paul's Cathedral, two or three of which are illustrated, among the most real stained glass art exemplified in the book; that is why we far prefer the style of Mr. Holiday's own west window in St. Saviour's, Southwark, or his Quillinan memorial window, both of which are pure symbolism, to such a design as "Joseph leaving Pharaoh's Court," where we see a gallery in the rear and steps coming forward to the foreground, down which Joseph is advancing, and the two ladies (with a curiously modern air, by the way) walking away from us into the background. That would make a very good mural decoration in fresco painting; we do not call it a good stained glass design. In the author's window in Salisbury Cathedral (fig 10), which is almost entirely a pure glass design, the æsthetic completeness is just spoiled by the little bits of perspective seen through one or two of the arches in the lower compartments. As Mr. Holiday himself says—"If the mind of the spectator is once entrapped into a false position by attempts at pictorial realism in the glass, he will misread the whole work. If he gets realism in one form he will expect it in another." Nothing could be more true; then why not act up to it always and consistently?

The question of the supporting ironwork in wide windows without architectural divisions is rather a difficult one. Mr. Holiday recommends that the design should be made with some regard to them, at all events to the extent of getting the bars to fall, as far as possible, where they will either coincide with some prominent line in the design, or avoid crossing any important feature, especially a head. The point seems to be whether the iron supports should be recognised as a part of the design or not. Mr. Holiday has shown one design (fig. 11) for a window in the Brick Church at New York, where the metal framework is treated almost as a simple form of tracery, and marks with arched heads the main divisions of the design. We should not go so far. The iron supports are not a portion of the architectural design, they are a practical necessity which we would do without if possible. They ought not therefore to be recognised as part of the design; only the design should be studied so as to escape being prominently interfered with by them.

The author's circular window in the Theological College, New Jersey, is a good example. The metal bars, though carefully avoiding the heads, make horizontal cuts through the space between the inner and outer circles, in a manner quite at variance with the main lines of the work; but just because we feel this, and that they are not intended as part of the design, we are able to ignore them. If they had been arranged as equidistant bars radiating from the centre of the window, they would have forced themselves on the eye as claiming to be an element in the design, and would have caused much more annoyance.

What does the author mean by saying, in reference to the Chartres and Florence windows illustrated in figs. 2 and 7, that "such shading as there is in these windows serves to suggest natural forms, but is treated solely as a means of heightening the beauty of the glass"? The words imply that the shading was introduced only to add to the decorative effect of the glass; which surely cannot be the right way to put it. That it was (and rightly) carried out in such a manner as not to interfere with the decorative effect would surely be the more correct expression.

In the chapter on "Style" Mr. Holiday puts more effectively than we have seen it put before the absurdity of the modern manufacture of mediæval windows, with many trenchant comparisons which hit hard; what he says is what all artists are agreed upon, but a large proportion of the public are still in the dark on the subject, and may learn something from this chapter, if they will read it. Mr. Holiday particularly instances, as a concomitant evil of the trade manufacturing system, the deadening "division of labour" among the artisans, so that one man has only learned to do one thing, and "the one who painted draperies could not paint a head." It was mainly on account of this, and the consequent difficulty of getting his work carried out in the spirit which he wanted, that the author established his own glass-making works, where he abolished the division of labour and had the whole making of a window under his sole control from first to last.

In considering the question of Style in relation to architecture and ornament, the author, while repudiating the idea that any concession can be made to architectural style in the matter of the figure, touches on the interesting question how far ornament, in a window inserted in an ancient church, or in a building in any special architectural style, should conform to the recognised types of ornament of that style. While admitting that the point is quite open to argument, he leans towards the conclusion that well-designed ornament—that which is really ornament and not "ornamental painting" (like Raphael's arabesques), will harmonise with any good style of architecture. This position must not be pushed too far; Arabic ornament, for instance, has a very marked character of its own, and would look much out of place in a building of Renaissance stamp; but in the main we think it is correct. The grisaille ornament shown in fig. 41, from the author's window in Salisbury Cathedral, would do equally well either in a Classic or a Gothic building; and the fact is that one of the effects of conventional treatment of foliage is to tone down special characteristics in natural leafage, and to lead to the evolution of an idealised foliage which cannot be claimed as belonging to any particular group, either botanical or architectural.

There are other interesting points raised in regard to the treatment of figures and drapery in windows, as to which we are mainly in agreement with the author, but for which we must refer the reader to the book.

We could have wished that the digression (for such it certainly is) on pages 71-74 had been omitted; it is out of place in a work on art-processes, and because an author is an authority about stained glass it does not follow that his readers attach any special value to his opinions on religion and on international morality. But on the subject of which it mainly treats the book is one which is calculated to clear the air a good deal.

## NOTES.

The Institute at Peterborough.

ON Saturday a small party of members of the Institute of Architects visited Peterborough, by the invitation of the Dean to have the opportunity of inspecting the west front of the Cathedral. The party was limited to thirty, and the visit was considered as a private one, as it had been already announced that the Institute would take no public action in the matter. We hear, however, from a member of the party, that the visitors in general thought the state of the front even worse and more alarming than they had realised from description; and this we fancy will be the remark of most architects who have any opportunity of seeing it for themselves. Among other things a careful examination was made of the bonding of the piers, which was pronounced to be exceedingly faulty in method; in fact, says our correspondent, "such as would not be tolerated by any reputable architect" in the present day. The Dean and Chapter, it is interesting to learn, have purchased an old farm-house built of Barnack stone, in order to use the material for piecing the front where new stones are absolutely necessary.

The London Water Question.

IT is not altogether satisfactory that apparently the intentions of the Government in regard to the water supply of London should have been made public in a hole-and-corner manner. It is understood that when the President of the Local Government Board met the London Unionist members this week he informed them that the Government proposed to support the second reading of the London County Council's Bills. By supporting the second reading, the Government agrees to the principle of the Bill, which is that the County Council should be the public body in whom the management of the water supply is vested. This of course is a policy quite opposed to that of last session, when, as will be remembered, the Government proposed to establish a "Water Trust," or separate body, to look after the water supply of London and the adjacent districts. We have always been of opinion that it would be best to place the management of the water supply in a separate body, created for the purpose only. If, however, the Government have come to the conclusion that it is impracticable to establish such a body, then the only course open to them is to make the County Council the water authority. But this sudden change of policy on the part of the Government says little for their capacity as vigorous politicians.

Patina on Ancient Bronzes.

TO the last number of the *Revue Archéologique* M. Henri Lechat contributes an interesting paper on the nature of the patina on Greek bronzes. It has usually been supposed that this patina, often beautiful in effect, was produced by a natural process of oxydisation, due to exposure to the air and to chemical action of the soil. The question of natural *versus* artificial patina was raised, it will be remembered, long ago (Plutarch, "De Pyth. Orac," II.), by visitors inspecting the bronzes at Delphi, some of which were covered with a beautiful deep blue patina. M. Lechat holds it certain that in many cases the patina was produced artificially by the artist himself, and was an effect he deliberately aimed at; in fact, patina in bronzes played the part of polychromy in marble statues. In such cases a kind of coloured varnish was applied to the bronze, which materially affected and aided the natural oxydisation. The precise effect, he believes, was known and carefully allowed for. The exact chemical process M. Lechat does not discuss, nor does he seem hopeful that it will ever be formulated. The paper should be of interest both to artists and archæologists.

Railway Rates.

THE Mansion House Association, who have had the subject of railway rates legislation under discussion this week, and who have for years been very persistent in pressing it upon the attention of Parliament, are far from satisfied with what has been achieved. The interpretation of the Acts has proved rather uncertain, and the railway companies manifest a great disinclination to regard the decisions in the test cases promoted by the Association as final. It has always been a matter of complaint that the procedure before the Railway Commission is too expensive. The inquiries are certainly almost invariably very protracted—as in the apparently interminable coal case of Messrs. Rickett, Smith, & Co., which has just been to the fore again—and also that heard last week, in which the Manchester Ship Canal Company have sought the intervention of the Commissioners. They are asking for compulsory through rates for timber and other imports from the Canal Station to distant towns on the Midland Company's system. Although suing as a railway company, and with a view to bettering the position of the Canal in competing with Liverpool, the arguments, as usual, have turned very much upon "the public interest,"—a phrase occurring in the Act which appears of considerable service to others besides the public. Highly desirable as a cheapened form of procedure may be, however, it must be conceded that the questions involved are frequently of considerable magnitude, and the issues too far-reaching and complex to be decided by any but competent specialists.

Railway and Canal Traffic Acts.

THIS was the subject of an address by Mr. J. H. Balfour Browne, Q.C., on Wednesday at a special meeting of the London Chamber of Commerce. The lecturer referred to the well-known Southampton case, in which the question was raised whether the South-Western Railway Company were entitled to charge English traders for the conveyance of goods from Southampton and intermediate stations to London a higher rate than was charged for similar goods coming from abroad. As the lecturer said, this involves a large issue which must be settled before long if the English trader is to successfully compete with the foreigner. In fact, the question is of national importance, and its solution must give to the English manufacturer means of transport which are at least equal to those of his competitors; not only is the foreign producer favoured in the introduction of his goods into this country, but the home producer, when he desires to compete with a foreign rival in a continental or colonial market, finds the home railway rates against him and foreign railway rates in favour of his competitors. The lecturer suggested various alterations in the present railway law, and urged that some further control of the railway companies was needed. Whether any expedient similar to that which now existed in the case of gas companies, by which the company was allowed to divide a dividend larger than the standard dividend only when they reduced the price of gas below the standard price—and by which the profits were in effect divided between the shareholders and the customers—could be devised for railways it was difficult to say. But short of the acquisition of all the railways by the State, might not an experiment be made in that regard? There were in this country a considerable number of railway companies which did not pay, and had not paid, any dividend upon their Ordinary stock for some years. It would therefore be easy for the State to purchase these derelict lines at a price which would put no great burden upon the taxpayer—and if they purchased these lines the public would insist upon their being worked at rates which were reasonable in the interests of the community. In that event State competition, by means of these at present derelict lines, would introduce a wholesome element into the railway world, and would, he thought, make the other railways of this country so conduct their business towards trade as to make the purchase of the whole of the railways in the country a matter which might be indefinitely postponed.

The Flushing of Closets and Drains.

A SERIES of tests for the purpose of ascertaining the volume of water required to flush water-closets and to keep the drains from them clean was carried out last year at Newcastle by the Newcastle and Gateshead Water Company and the Northern Architectural Association, and formed the subject of a paper read by Mr. Arthur B. Plummer at the Sanitary Congress held at Newcastle in September last. The tests are far from exhaustive, and some of the conclusions which Mr. Plummer draws from them do not appear to us to be reasonably deducible. His opinion that "all syphon cisterns are a mistake, so far as water companies are concerned, and . . . . not necessary from other points of view," will not be generally accepted by sanitarians. Briefly, the tests afforded further proof that drains are now usually too large and that iron drains are kept clear more easily than stoneware drains of the same gradient. They also showed that drains were soon choked by artificial fæces carried into them by a two-gallon flush from a water-closet, while a two-and-a-half-gallon flush sufficed to keep them clean. It may be pointed out that the drains in these experiments were laid with less inclination than is customary for branch drains. A fall of 1 in 40 may be sufficient for a 4-in. drain running constantly about half full, but it is not sufficient for a branch drain having an ntermittent flow. The well-known rule that

*d*

a 4-in. drain may have an inclination of only 1 in 40, and a 6-in. drain 1 in 60, has probably been as much misapplied as any other rule; it is intended for drains running half full, and is *not* applicable to drains running only one-fourth full or having a very variable flow.

London Flushing Cisterns.

IN connection with the same subject we may call attention to the letter printed in another column, signed by the managers of several firms or companies dealing in sanitary appliances, and complaining of the new and baneful activity now shown by some of the Water Companies in endeavouring to require the removal of 3-gallon flushing cisterns and the replacing of them by 2-gallon ones, in defiance of sanitary science and common sense. The Companies are unfortunately within their legal right, and are now stimulated to fresh activity by the recent illjudged and mischievous action of the Local Government Board (who were evidently misled by some persons acting in the interest of the Water Companies) in formally confirming the 2-gallon cistern. We heard only a few days ago of the case of a house on one of the London ducal estates, where the tenants under a new lease, doing up a house in a manner regardless of cost, had at the demand of the Duke's agent inserted 3-gallon cisterns, and were forthwith served by the Water Company with a notice to remove them! It is impossible that this kind of thing can go on much longer; public opinion will not stand it; and the Water Companies are acting very unwisely in thus putting themselves forward as the opponents of sanitary progress at a time when their very existence is threatened.

Broadclyst Church, Devon.

WE are informed that a scheme is on foot for the "complete external restoration" of the tower of this church, and that the Vicar is anxious to receive subscriptions for that purpose. Is anything so sweeping as is implied in the term "complete external restoration" really required? If not, it ought not to be done. It is stated that the pinnacles are in a dangerous condition, partly from injuries received in the recent gales, and that their total collapse is inevitable unless measures are soon taken to make them secure; and also that it is desired to add two additional bells to the existing six, to complete the octave. These are perfectly rational objects, in aid of which subscriptions may reasonably be asked from those likely to be interested in the church. But when we are asked to draw the attention of "those interested in old English church architecture" to the fact that the complete external restoration of the tower is contemplated, we may as well point out to the Vicar that, unless the external masonry is in such a condition of decay that refacing is practically necessary, those "interested in old English architecture" are exactly those who will demur to subscribing towards its restoration.

Illicit Commissions.

FROM a circular letter dated February 5 we are glad to learn that the Council of the Chamber of Commerce has appointed a Special Committee to inquire into and report upon the subject of "the pernicious practice of giving and receiving secret trade commissions." One of the obstacles towards effectually contending with this evil has always been the difficulty of obtaining evidence of a practice which is essentially an underhand one; and it is no doubt in recognition of this difficulty that the following sentences have been incorporated in the letter which the Secretary of the Chamber of Commerce has been instructed to write:

"In order that the Committee may have the fullest information before it I am desired to make it known through the medium of your valuable columns that the Committee are willing to receive and consider *confidentially* any evidence or information on the subject which any one may be disposed to bring before it.

I am further desired to invite confidential communications to be addressed to me by letter, or to be made to me verbally to be laid before the Committee, and to say that no communication or information will be given to the Committee without the previous consent of the party forwarding the same.

I have also to add that any communications or information which may be given to me will be treated in the strictest confidence, and no names or particulars will, unless authorised, be allowed to transpire even in Committee."

Communications of the kind mentioned can be addressed to the Secretary, Mr. Kenric B. Murray, at Botolph House, Eastcheap. The mere publication of such a request for information will be enough to put a considerable check on the practice referred to, as any one making such offers may be denounced to the Chamber of Commerce, under circumstances which will prevent the denouncer being in any danger of an action for libel. We have done what we could, on various occasions, to expose the practice as far as it concerns the architectural profession and the building trades, and we are glad to find that the subject has been taken up in a formal manner by so important a body as the Chamber of Commerce.

The London Dwelling House.

THERE is no doubt that Dr. Poore, in his lecture on "The Dwelling House" briefly reported in another column, is perfectly right in his strictures as to the increasing evil of overcrowding, and the inconvenience and labour entailed by the increasing development in London of the tall and narrow type of house, in which, as he observes, all changes from room to room have to be made vertically instead of horizontally, with great increase of fatigue both for owners and servants. The most serious evil of the modern tall house, however, is the manner in which it promotes overcrowding, by providing lodgment for a much larger number of persons over the same square area of ground. With all this we are quite in agreement; but what is the remedy? Dr. Poore does not seem to suggest any; he confines himself to pointing out the evils. In doing so he is perhaps preparing the way for a gradual improvement, by promoting the growth of a public opinion adverse to this vertical piling up of dwellings, which may in time have its effect in lessening the supply of them. But such an influence must be very slow in producing any sensible improvement. Do we not require some legislation limiting the number of persons who can be housed per square rood of surface, so as to put a compulsory check on this vertical overcrowding?

The Kerry Bog Slide.

THE Congested Districts Board of Ireland are considering the advisability of carrying out several works in the district recently devastated by the bog slide in Kerry. Amongst other things, it is proposed to reopen a quarry by clearing it of the mud; also to erect a bridge, re-make roads, to clear the lands at present covered with peaty matter, and to restore the area as far as possible to its former condition, so that the ground may be used for agricultural purposes. So far, so good. But we cannot find that anything is going to be done to the remains of the bog to prevent further slides, or to prevent the peat from accumulating again at the same spot. No scheme which does not include an elaborate system of drainage will be of any use in remedying matters, and we doubt if the results obtained in any case will be worth the expenditure.

Ventilation of Underground Railways.

THE comparatively recent fight over the "blowholes" on the District Railway is, no doubt, within the recollection of most of our London readers, although the efforts of the Metropolitan Railway to secure ventilation are not so well known. It is interesting to note in this connexion that it is now definitely proposed to work the District Railway by electric haulage, under powers to be obtained this Session, together with the deep level express extensions. We are inclined to doubt, however, whether it would not be a much sounder policy, considering the large amount of extra capital involved, to make a further attempt to obtain a thorough system of ventilation under the present *régime*, worked by the induced currents caused by the trains themselves. Such a system can be employed without unsightly blowholes, and with a great improvement on the present outlets for the vitiated air.

Floods and Reservoirs.

THE rural districts have lately passed through one of their not uncommon periods of floods. Water is too abundant, and has become a nuisance, doing harm to property and health. In about six months' time it is quite probable that many of those localities which are now complaining of floods will be crying out about a drought. The fact is that as regards the storage of rain-water no proper progress has been made. In the rural districts, and in small semi-urban localities, far too much dependence is placed on the springs. The health, comfort, and well-being of many districts would be greatly improved were some of the great quantity of rain-water, which is now allowed to run to waste, preserved in reservoirs. The latter are very easy to construct. Some labour for excavation, a good bed of concrete, a sound cover, and a large pump, pretty well complete the tale. There is hardly a village in the South of England which would not be the better for such a reservoir, and Parish Councils should take up the matter. Again, landlords are very short-sighted, in places where the soil is dry, not to construct tanks on their farms. There is often in dry summers a large sum spent on extra labour in conveying water to dry places, and a serious pecuniary loss to farmers by the want of it. Yet this could be almost entirely prevented by the storage of rain-water in tanks when it is abundant.

The Manufacture of Enteric Fever.

DR. BRUCE LOW'S Report to the Local Government Board on the cause of the recent outbreaks of enteric fever at Kessingland, in the Rural District of Mutford and

Lothingland, Suffolk, states that there is no proper system of sewerage; excrement and refuse disposal is chiefly by means of pit privies; these are situated generally close to the dwellings, and are excavated below the level of the ground; some of them have no brickwork lining to their sides or bottoms, and consequently readily permit the soakage of fluid filth into the porous soil. The water supply is from surface wells, also situated "generally near the houses," and merely dry steined. The manufacture of enteric fever is thus carefully and scientifically provided for.

The Paris Lady Artists.

THE "Union des Femmes Peintres et Sculpteurs" have opened their sixteenth annual exhibition at the Palais de l'Industrie, which this year includes some remarkable works, half lost among a preponderance of inferior productions. The exhibition includes over nine hundred works. Among the good ones are various contributions by Mdme. Demont-Breton; Mdme. Elodie La Villette exhibits a remarkable sea-piece, and Mdlle. Beck a painting of calm water which is also worth attention. Miniatures by Mdlle. de Chaussé, flower-paintings by Mdlle. Voruz, some landscapes by Mdme. Séailles, are among other things that are a credit to the exhibition; and in sculpture, a statue by Mdme. Coutan, a bust by the Duchesse d'Uzès, and some very pretty polychromatic wax figures by Mdlle. de Fresnaye.

The Carfax Tower.

THE people at Oxford who were hostile to Mr. Hare's proposals for the treatment of Carfax Tower seem to have succeeded in getting Mr. Bodley called in to advise, no doubt in the hope that he would demolish Mr. Hare; but his report, which was printed in full in the Oxford *Weekly News* of last week, practically only repeats Mr. Hare's recommendations, except that Mr. Bodley thinks that to reface the lower portion with wrought ashlar work would make it look too much like a new work. As Mr. Bodley admits that the lower or ancient portion of the tower must be refaced for practical reasons—on which point he is as strong as Mr. Hare—it might seem that as the exterior facing will actually be modern work it is not of much consequence how modern it looks. Mr. Bodley entirely concurs in thinking that the upper stage of the tower is of no value whatever, and should be rebuilt in a better style. Altogether the opponents of Mr. Hare have certainly not made much by calling in Mr. Bodley.

## THE ADVANCEMENT OF ARCHITECTURE *:

### WITH SOME REMARKS ON THE STUDY OF GOTHIC.

ARCHITECTURE, properly so-called, does not exist without an ideal or emotional side, and it is always hemmed in by the practical difficulties of construction, so that when the art of construction has greatly advanced, recondite emotions can be more readily expressed: take, for example, the Propylæum of the Acropolis. The central opening had to be made large enough for the herds of sacrificial cattle to pass through, but this span of something like 17 ft. 10 in. could only, in monumental buildings, be spanned by a stone lintel before the arch was in use. At the central opening at the Temple of Diana at Ephesus a similar difficulty occurred. Although in both cases the marble quarries were near at hand, this large marble lintel had to be brought by oxen to the site, and in the case of the Propylæum it had to be dragged up a steep incline, and then rolled up a slope of earth to its place. In Pliny you read of the difficulties of the fixing this vast piece of marble at the Temple of Diana, the despair of the architect, and the assistance of the titular goddess. At Lincoln Cathedral you have the flat arch of 28ft. span, each stone of which could probably be carried up on a man's back, so you see how more complex emotions could be expressed constructively in the thirteenth century than in 450 B.C., though in the thirteenth century there were vaults of much larger span. I mention the flat arch on account of its flatness, its rise being only about one-twenty-third of its span. You see in the latter part of the nineteenth century Sir Benjamin Baker building the Forth Bridge, one of whose spans is 1,700 ft., so that the constructive difficulties, as far as architects are concerned, have disappeared.

A vast change in the sentiments of mankind has, however, occurred since the sixteenth or seventeenth century; up to that time, or even later, mankind desired to embody every abstract idea by a building, a statue, a group of figures, or by symbols; but that desire has ceased, at least among the most advanced of mankind, and a little semi-scientific jargon is supposed to supply its place; leaving the mind of the masses completely vacant of instruction. The principal embodiment of law and order in their minds is the policeman, by no means a high ideal figure; while punishment and penal death is embodied by a man in a big chair with a gown and a wig, not so very unlike a Japanese Venus. The glimpses the scientific men have got of our visible universe and of its laws, and the rough results which are spread abroad, so far from diminishing our wonder and our awe, should increase them; but nothing is done to embody these wonders, so that they may be understood by the multitude. The pangs of grief, of guilt, and of remorse are not extinct in the human breast, the cries of misery, agony and despair resound from the whole earth, and yet we are told that there is no occasion for religion; and we are even without the consolation of the Stoic philosopher, Epictetus, who tells us that Jupiter said to him, "I would have made you always comfortable and happy if such a state were compatible with the conditions of the universe, but it is not; consequently I have given you a particle of the divine spirit by which you will be enabled to bear without complaint the necessary evils that will occur, and when these become intolerable you can go out."

I have adverted to these matters, which may appear irrelevant, to point out that to learn to evoke emotions from architecture we must study their embodiments in the structures dedicated to extinct faiths and worn-out creeds, to show us how to evoke the emotions proper only to our own time. We cannot afford to neglect the study of the embodiment of the emotions by any past race, nor can we afford to lose the æsthetic or practical lessons that they teach, and least of all can we afford to do without a study of Gothic, for it is certainly one of the most wonderful phases of architecture that the world has seen.

My Romanesque lectures brought us down to the time at which the groin points of vaults had just begun to be superseded by ribs, the rudiments of which are found at the front half of Vezelay, the choir having ribs, and exterior flying buttresses.

We might have supposed that the Romanesque architects would have been satisfied with the knowledge they had then got of the strength of materials, the solution of the apparently insoluble problem of vaulting in thin stone securely, and with the sort of buildings they had already erected (we must not, however, forget that in the thirteenth century, architecture from being a clerical art became a lay one); but so far was this from being the case, that new features were at once introduced, and the style progressed for 300 years and continued for at least 450 years, for the piece of fan-vaulting over the staircase to the hall at Christchurch, Oxford, was built in 1640. We must remember, however, that the Renaissance in Italy began early in the fifteenth century. Poggio discovered the MSS. of Vitruvius in 1414, and Brunelleschi had measured some of the Roman ruins and began to build in the new way about 1419. Leon Battista Alberti built at Rimini the Temple to Isotta for Pandolfo Malatesta in 1447-50, and the Rucellai Palace at Florence in 1460. The visits of Charles VIII. and Francis I. to Italy, where the revived Classic taste permeated society, were probably the cause of that grafting of Classic detail on Gothic that so charms us in Blois, Chambord, and the other early Renaissance buildings of France. About 1506 Torrigiano paid a visit to England, and a little later executed the tombs of the Countess of Richmond and Henry VII., and probably encouraged a taste for the Classic revival. At Hampton Court Palace there are Renaissance terra-cotta medallions of the Roman Emperors. Holbein came over in 1526, and John of Padua in 1544, if not earlier, and is supposed by some to have furnished designs for Wollaton Hall, while Daniel Barbaro, one of the editors of Vitruvius, and one of the patrons of Palladio, was ambassador here about 1550.

It seems curious enough to us that a highly organised phase of architecture, like Gothic, that seemed to meet every want of its time, ecclesiastical, lay, and military, and that by the knowledge, skill, and genius of its architects had rivalled the buildings of the Romans in size and height, and nearly equalled the spans of their vaults, should have been supplanted by a futile attempt to revive Roman work. We must, however, remember that when society has been permeated with new beliefs, new hopes, and new aspirations, it wants a new phase of architecture to express these changes. This was the case at the Renaissance, and from the absence of architectural schools and trained architects, there was nothing to be done but to fall back on the less developed phase of Roman, which would at least express some of the most prominent of the new ideas, such as the appearance of solidity, simplicity, and grace. The sciences fortunately are not carried on in this way, the new advances are built on those that have last been made and tested. If this method could be adopted in the fine arts, our painting, sculpture, architecture, music, poetry, and eloquence would be as much in advance of the best of bygone times as our arithmetic is beyond that of the Romans, or our astronomy is beyond that of Job.*

I think, however, that in architecture we are wrong to abandon any advances that have been made in the knowledge of materials, construction, or arrangement, if it can be helped; for instance, I doubt if we should revert to the massive pier of the Romans, which is expensive, and reject the flying buttress, which is a cheap substitute, merely because we do not like the look of a building permanently shored up with slight stone-shores. We might make the flying buttresses stronger, so that they were not a constant menace to the building through their decay by weather wear. And we might try and make them beautiful, according to our own taste, and not by geometrical piercing that is not. Their main use to us now is to see how they managed in Gothic days to give them an architectural appearance; they were originally plain arches, but were eventually made into pierced work or open arcades. The flying buttress was an entirely new feature, and one purely structural, and was brought into harmony with the rest of the work. Now, if we wanted to roof a building with an incombustible ceiling, we should use ironwork, concrete, and plaster, or coloured and enamelled terra-cotta. The using of bygone forms of construction is archæological pedantry or incompetence; and we should throw off the pedantry, and try to make ourselves competent. Architecture is essentially a constructive art; the first and more important part is to make the general forms, both inside and out, of such a character as not only to perfectly meet the wants, but also to proclaim the use of the building; and the higher its use, the more important is it that the shapes employed should suggest that higher use.

Those important structural parts that arrest the attention have all to be made conducive to that end; the Greeks used round piers to look like columns, and the parts of the column, when it was originally of wood, *i.e.*, the capital and base were necessary, and eventually those necessities were made as beautiful as possible. The Romans used monoliths when the weight to be carried was considerable, and beautified their capitals more or less after Greek models, modified to suit their coarser taste. The Byzantines kept close to the Roman examples, only modifying the abacus to take larger piers and heavier weights, and greatly varied the shape and the carving of the capitals. Many of their capitals are cubical and their carving superficial, so that the mass of the capital was preserved to bring down the weight securely to the shaft. The early Mohammedan columns were mostly Classic or Byzantine taken from old buildings, but their later capitals were

* Being the second Royal Academy Lecture on Architecture this session. Delivered on the 28th ult. by Professor Aitchison, A.R.A.

* That is to say—if Art were Science; which it is not.—ED.

of the Stalactite form, or with their own poor floral ornament, either keeping the concave outline of the Corinthian or the solid cubic or ogee form of the Byzantines. The early Romanesque architects sometimes used enormous piers, column-shaped, as at Durham, Peterborough, Southwell, Gloucester, &c., with shallow caps, and even when thin shafts were used, the cap was often comparatively shallow.

As the Romanesque architects progressed in knowledge and skill they got their sculptors to carve their capitals mainly with figures.

The Gothic architects threw aside all thought of Classic proportions—at any rate above the bases of their columns or piers, and ran up their piers to a great height, and let their sculptors use floral ornament almost exclusively for the capitals; the foliage was altered from nature to produce a more broken surface, with brighter lights and sharper shadows, but the foliage of their capitals was almost destitute of interest or grace.

As the Gothic architects became abler constructors, they more and more lost all sense of artistic beauty, and trusted to their utilitarian success, by this I mean the better lighting of the nave by enormous windows, and to the astonishment of the beholders at their apparently insufficient and acrobatic construction; a paltry ambition. The great feature of the latest cornices was a large, flat hollow, filled in with stone imitations of the articles in gingerbread from a country fair. The structural perfection attained in late Gothic culminated in the single open-work spire of Strasburg, supremely wonderful, and supremely ugly.

We saw in Romanesque architecture the logical tendency of the times. The architects found that the Romans had always used a column to support something definite, so they did the same, and carried up the wall pillars to support the roof truss; the stepped arches, a purely economical arrangement to save centring, were each supported by a separate column. The piers were sometimes made cruciform, with a half column on each face to resist the thrust of separate arches, and sometimes they clustered the columns. The Gothic architects carried this out more completely, and carried down every rib by means of columns surrounding the main one, and afterwards made them attached; and eventually they superseded the columns by a pier down which the ribs of the vaulting descended, though this is describing how they were designed; looking at them we should say that the channelling of the piers ran up and formed the mouldings of the arches of the aisles, and the ribs of the vaulting of the nave and aisles, or else a cylinder was supposed to have fallen from heaven on to the channelled pier leaving the projecting bits of the original one sticking out. The rib and panel vaults are a useful and most interesting study, showing the gradual multiplication of the ribs, eventually forming patterns known in English Gothic as stellar vaulting, such as those in the cloister at Westminster, at Oxford Cathedral, and elsewhere. Some of these ribs abroad were made into curious and pretty patterns, as at the Cathedral of Las Palmas, Grand Canary; in England, however, the stellar vaults gave rise to the fan vault, in which real ribs ceased to be used, the very numerous thin and small ribs were worked out of the solid voussoirs, and in some places in England and abroad flat stones were carried by open work on the curved ribs, an instance of this may be seen under the rood screen at Southwell. Most of the progressive steps are shown and explained in Professor Willis's interesting paper read before the Royal Institute of British Architects in the year 1842. However much the Gothic architects may have lost their early artistic sense, some qualities remained with them to the last. They never lost their logic, their daring, or their excellence in mechanical contrivance. They made their windows where they were wanted, and kept them of the requisite size for the lighting they had to do, and when stained glass came into vogue, a church was all window, except where the buttresses occurred, and this is only one instance, for if they found the slopes of their buttress tables did not take off the rain fast enough, or that the splashing of the rain damaged the stonework above, they made them steeper and steeper, until they perfectly answered their purpose. The height and slightness of Strasburg spire is certainly an instance of their daring, and there are innumerable instances of their ingenuity in mechanical contrivance in windows. For example: When the stone was hard they used pierced slabs; when it was soft tracery; and some of their late tracery is as mysterious as the eddies of a stream, and, as compared with the size of the building, as slight as a spider's web. With an elastic style like this, neither the architects nor the sculptors were ever at a loss for invention, and they trusted to a general picturesque effect however incongruous the parts might be, *e.g.*, if a pointed arch were wanted with a rose-window beneath it, they put the circle in and left the point to take its chance. I by no means wish to depreciate the invention either of the architects or the sculptors, but, as compared with a Greek or a fine Early Renaissance building, the task was slight when anything crammed in would answer the purpose. In such vast buildings with such infinity of detail, forgotten pieces had sometimes to be filled in impromptu. At Ely Cathedral there are two buttress tops which had been apparently left for appropriate buttress caps to be designed for them. I suppose these had to be finished in a hurry. I presume some plants had grown up in the accumulated dust on the unfinished square tops, and the architect had these wind-sown plants cut in stone to make a finish.

Architecture would not be one of the master arts of the world if it did not require the possession of so many varied capacities, some of which, if not antagonistic to one another, are rarely found in the same person. Great architects can, therefore, be only looked for occasionally, when men of exceptional genius, industry, and ambition embrace it. Architecture rarely arrives at any great pitch of excellence all at once, even if it ever does; there is mostly a school with an aim, in which the knowledge that is acquired in one generation may be handed down to the next as the foundation on which a new edifice can be raised. Unhappily, the method of teaching in the different schools from which the brilliant epochs of successive architectures have sprung has been entirely lost, and we can only very imperfectly judge of what it was, by an exhaustive study of the buildings that have come down to us. We must recollect that before the last century much of the knowledge that can now be got from books was personal or traditional, or was worked out by some rule of thumb. Until Wilkins, in 1812, found out what Vitruvius meant by his "unequal steps"—"Scamilli impares,"—no one had suspected the optical refinements of the Greeks, and it was not until Mr. Penrose verified their existence at the Parthenon that we could appreciate the geometrical knowledge of the Greek architects. We see by the plan of the Temple at Bassæ that there was some thrust against the columns, and a considerable number of pieces of the stone ceiling have been found. Professor Cockerell showed in his restoration a segmental arch, but, as far as I know, no one has calculated the thrust of such a ceiling, and the resistance that was offered by the wall and the attached columns, so we are in complete ignorance as to the truth of his hypothesis. We know a little of the early Roman knowledge of construction from Vitruvius, supposing he lived into the reign of Augustus, for a learned Dane, a Mr. Ussing, has just published a treatise to prove that Vitruvius was a literary man who lived in the third or fourth century A.D. We know that the Emperor Constantine started schools of architecture in certain parts of the Roman dominion, but we know not what was taught. Still, we know Sta. Sophia, and since the publication of M. Choisy's "Art of Building among the Romans, and the Byzantines," we know more about the methods of both people than was ever known before, since the irruption of the barbarians. Mr. Tarn, too, has given those who will take the trouble of learning it, the methods of calculating the thrusts of vaults and domes. We know that a profound knowledge of stereotomy was possessed by the Gothic architects from the researches of Professor Willis, Viollet-le-Duc, and others.

Let me, however, enumerate the requisite equipments of an architect. He wants first to know the strength of materials and their resistance to the ravages of the weather. He wants to know by experience, or still better, by calculation, *statics*, or the equilibrium of opposing forces. He wants not only to be able to plan conveniently, but so that the shapes both of his whole building and of its internal parts have the proper character. He wants the whole and every part to evoke the emotions proper to the structure, and these emotions vary at different epochs. The masterpieces of Greek, Roman, Byzantine, Romanesque, Saracenic, Gothic, and Renaissance architecture aroused enthusiasm and admiration when they were built. Some continue to do so still, some are only viewed with indifference, while others excite contempt or disgust. The question for us now is, how cognate emotions can be raised by us in the present, or by some of our successors in the immediate future. That we do not raise the enthusiasm and admiration we hope for and expect, is, I fear, only too obvious, for who ever hears of an architect or his building calling forth anything but condemnation or censure, and when the building does not, it is supposed to have built itself. This must, I think, be due to one of two causes—either that the public are incapable of enthusiasm for architecture, or that at present the architects are unable to apply the proper stimulus. During the Gothic period, we read of the building of a cathedral in a town evoking an enthusiasm akin to madness; the townspeople not only contributing to it in money and kind, but men and women too, dragging in the materials, and working at the building, assisted by the monks, and even on some occasions by the aged bishop himself. I am far from supposing that this enthusiasm was wholly due to expectant artistic delight, or even to a better chance of getting to heaven. These cathedrals were a mark of earthly benefits that had accrued to the people by the exertions of their bishops, and were built with a prospect of obtaining still further benefits. Many doubtless looked forward to seeing new beauties and new structural achievements, that were beyond their fondest expectations; while all were ready to admire in anticipation the size and splendour of the proposed edifice. The people looked for more well-paid work being wanted, to the immense advantages of a new centre of attraction; opportunities, too, for their own intellectual or artistic exercise, that did not bring with it pains and penalties. Dull and unimaginative as people now are, I think if a man discovered a gold reef in which all might share, and from which those harpies who get all the benefit of new discoveries and inventions were driven off, were to suggest the building of something grand and novel as a thanks offering, and promised that, when the building was done, he could lead them to still greater advantages, there would be no want of subscriptions or enthusiasm now.

There must be a certain amount of liking for every creation of beauty and perfection, as we saw by the Greek revival in the last century. We look on the last century and the beginning of this as peculiarly tasteless and inartistic periods; yet this Greek revival gave us some admirable works, of a beauty of proportion, of a delicacy and refinement that we now look for in vain, though the style is not fitted for our climate, and is in some respects even absurd,—still, it touched chords in us that are not touched now. I may mention such buildings as the National Gallery and University College by Wilkins, the Bank of England and Bank buildings by Soane, the Sun Fire Office, the London and Westminster Bank and Hanover Chapel in London (now, alas, destroyed), and the Insurance offices, at Liverpool, by C. R. Cockerell, as well as St. George's Hall, by Elmes, in the same town. We, therefore, need not be surprised at the passion for the cathedrals of the thirteenth century while the Gothic style was being elaborated, when, too, the buildings were not only erected to the highest end, and showed the greatest constructive skill the world had seen, but met every taste and passion of the day. We have an intellectual admiration and a pride in the Forth Bridge, which only carries a railway conveniently and cheaply; what should we feel if it were also our ideal of perfect loveliness? But even then it would not excite the admiration caused by the Gothic cathedrals, embodying, as they did, the very highest aspirations, and offering the highest pleasures then known. There was the colossal structure, the very acme of skill of those days, with its lanterns, towers, and spires bathing in the sunshine, or peering through the mist, turned into mother-o'-pearl by the moonlight, or cut out of ebony against the moonless sky. In its day the cathedral was the very ideal of beauty, full of illustrations of natural and scripture history, of ethics, of the sciences, of fables, and of every traveller's tale, and like nothing ever seen before. Inside it was refulgent with stained glass, with a gorgeous ceremonial, where plate, jewellery, and enamels, gorgeous robes and hangings were exhibited, and where imposing, brilliant, and solemn processions were seen, while the curling clouds of incense ravished the senses, and captivated the imagination. In it the ear was pierced with the sweet sounds of singing and music, and the highest eloquence of the day roused the passions or pictured the way to heaven, and where the contagious adoration of crowds carried the soul upwards as on wings. On nocturnal festivals, where all these delights were heightened by a brilliant illumination, the

church must have suggested heaven, and the black shadows the abysses beyond.

Matchless as was Greek civilisation, dignified as was Roman, gorgeous as was the Saracen, we can hardly picture to ourselves any ceremonial of theirs so congruous and so striking as high mass in a newly-built cathedral of the thirteenth century. The earth was then held to be the centre of the universe, as man was the highest creature in it, with Heaven for his goal. When the rude and poverty-stricken worshippers were gathered in multitudes to offer their adorations in a building that was awe inspiring by its size and proportions and to them of superhuman skill, witnessing a ritual as splendid as it was solemn, performed by holy men for their salvation, they must, when they flung themselves on the marble pavement at the elevation of the host, have felt themselves ascending to heaven to enjoy all this gorgeous pageantry and delight, without satiety and for ever.

## THE ARCHITECTURAL ASSOCIATION:

### AN UNWRITTEN CHAPTER OF ENGLISH ARCHITECTURAL HISTORY.

A MEETING of this Association was held on the 5th inst. in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Mr. Beresford Pite, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members:—Messrs. P. T. Chew, F. J. Corfield, O. S. Doll, S. A. Heaps, R. H. Withall, J. A. R. Inglis, G. L. O'Connor, J. Ormrod, and W. N. F. Woodland.

The Chairman said that, in accordance with By-law 35, he desired to formally nominate Mr. G. H. Fellowes Prynne as Vice-President, to fill the vacancy caused by the resignation of Mr. John Begg. As no other nomination was made, the Chairman then declared that Mr. Prynne had been elected as Vice-President for the remainder o. the session. He also announced that in order to fill the vacancy on the Committee caused by the previous appointment, he proposed to nominate the gentleman whose name was next on the election list last session, but who was not elected, viz., Mr. C. C. Brewer. As there was no other nomination, Mr. Brewer was then declared to be elected.

Mr. Banister F. Fletcher, Hon. Sec., proposed a vote of thanks to Mr. John Begg for a case of guide books which he had presented to the Library.

The Chairman, in putting the vote of thanks, which was agreed to, said that no doubt they would desire to add their hearty good wishes to Mr. Begg for a safe and prosperous journey to South Africa, and for his speedy return.

The Chairman then called upon Mr. Arthur S. Flower, M.A., to read the following paper, entitled "An Unwritten Chapter of English Architectural History":—

As the history of English architecture has not yet been written, no apology is due to any particular author for venturing to suggest a few unconsidered trifles, for which room might perhaps be found in such a work. But to an audience of architects, an apology for introducing a subject of this kind at the present day, seems very much needed. One is confronted at the outset with the question: Are not all such studies wholly useless and pernicious? Leaders of opinion confidently assure us that they are; and, knowing quite well the discsteem into which historical studies are at present fallen, I hardly dare to occupy your time with matters which so many architects desire to see not merely "relegated," but eternally confined, to limbo. It is simply in obedience to the request of the honorary secretaries, binding as a command on every loyal member of the Architectural Association, to provide a paper, which they specified to be "on a historical or scientific subject," that these notes are offered. I could think of no other subject but my own out-of-date and very unfashionable hobby of English Gothic architecture; but, as shirking the duty, or, as I think I ought to say, declining the honour, seemed out of the question, I took encouragement from a passage in the President's opening address, where he bade us, "study the mind in the building, through painstaking measurement and logical reasoning. Find out how and why every joint and form was made. The answer lies hidden in the building." This is just what for a long time I have been trying to do; and I am therefore at least acting on our President's advice, in bringing before you the results of some independent research into the history and characteristics of the Mediæval architecture of England. Waiving then, for the present, the great question as to whether any such studies are to be recommended at all, and assuming, merely as a premise, that a young architect wishes, for some reason or other, to learn something of the old architecture of his country, how can we best assist him? I should like first to quote some old advice given on this subject, which no one here can ever have seen in print. The extracts are lengthy but have a bearing on what follows. "If you ask how you are to study architecture, you will probably be told to read up the whole history of the art in all countries, with formidable lists of names, dates, and dimensions. You will have recommended to you treatises on the orders and styles, on rules of proportion and other arithmetical niceties; and will be further advised to read books on the principles of beauty and taste, and probably much poetical extravagance in addition. . . . . However we may define architecture, we must agree that it is a practical art, confined by the requirements of utility, the properties of materials, and the laws of mechanics. Therefore in studying it, be practical; put aside all considerations derived from archæology, sentiment, or association, and simply use your own eyes and your own common-sense; learn by observation and by reasoning, Ask the buildings themselves why they are as they are, and what is their meaning. Imagine yourself with the builders, asking what they are going to do, and wherefore. . . . . So, when you criticise, you will neither praise a building because it is correct or classical or reminds you of something which you have admired elsewhere; nor will you condemn it because it appears new and strange, or, on the other hand, familiar and unoriginal; you will simply consider, is it good in itself, that is, is it well fitted for its purpose and well adapted to its position, are its materials well chosen and well put together, is it expressive of its object and its construction, does its design show everywhere a striving after beauty. If all this is the case, it is good architecture; but if one of these qualities be lacking, though the building may display the most costly and splendid materials, the highest mechanical skill, the most careful workmanship, the most accurate copying of some acknowledged masterpiece, the result, as architecture, is bad. . . . . To criticise buildings, you must try to grasp the circumstances of their erection, and look at them from the point of view of a constructor. The disposition must be encouraged of thinking of a building as a thing composed of stone, brick, timber, and iron, erected for a definite purpose, and under particular conditions, and not, with the architectural writers of the last three centuries, as merely an affair of lines and conventional proportions and ornaments, quite independent of materials, use, or position, just as if it existed only on paper; nor, with some of our own day, as a thing whose essence is accidental picturesqueness, historic or romantic associations, or the superficial decoration of sculpture, painting, or heraldry." . . . .

*King ana Architect: from a Thirteenth Century Drawing.*

This almost anticipates the new philosophy of architectural materialism, and as we hear so much nowadays against even the use, and not only the abuse, of books in connexion with architecture, I quote these passages from an unpublished paper which I read to an amateur society many years ago. The present subject obliges me to make many references to books, so I wish just to clear the ground, and put myself in order, so to speak, by explaining that, having gone through the phase myself, I quite appreciate the standpoint, and can thoroughly enter into the feelings of certain good friends of mine, fellow members of the Architectural Association, who not only object to any form of book-learning, but even declare, as one quite lately did, that all architectural books ought to be burnt. There is truth, of course, in the idea underlying this—all the books in the world will not make one architect; but the easy proof of this proposition does not negative nor even weaken another one—namely, that books may be useful to architects.

Returning to our imaginary student, we tell him, of course, to go out sketching and measuring, and not to neglect to take notes of construction and materials; every one will agree in this advice. He then surmounts, let us suppose, every technical difficulty, until we find him able to draw with the utmost accuracy and most thoroughly artistic touch any subject he may meet with; he has seen and sketched hundreds of buildings, and acquired quite a respectable acreage of details; he can freely reproduce from memory any portion of his sketch-book; he is, in short, a consummate draughtsman; but there is still something wanting. I am not speaking now of the faculty for design, but simply of that knowledge of the architecture of the past which we are presuming that he desires. Does he really understand these buildings? For all that he has done so far, he may be no more capable of seeing into the ideas and motives of the men who built them than the most prosaic and mercenary photographer. The difference between the two is not necessarily more than one of manual process; the mental attitude of each may be substantially the same. Unaided observation, accompanied by however great technical skill in recording, will not enable a man to read the riddles of ancient buildings. Whenever curiosity begins to be aroused as to how, or when, or why, some particular work was built; whenever, in short, the student wishes to go a stage further, and to know all about what he is sketching, he comes to feel the need of definite guidance; in fact, he has recourse to books. He requires them for several reasons: to learn methods of arranging, connecting, and utilising his own disjointed memoranda; to obtain many indispensable facts, which he could not possibly discover for himself; to bridge over gaps in his own experience; to become acquainted with principles and theories which may throw light on what he has observed, or direct him into fresh fields of inquiry. Books on the history of architecture are not, as is frequently asserted, fetters forged by malign opponents for the

enthralment of art; nor are they simply labour-saving tools to assist lazy men in the mechanical business which they call their art. Rightly used, they are the means by which an architect may learn the true nature of his art, its difficulties, its qualities and powers, its grand possibilities. But architectural books lead us at once to the thorny question of styles. "Read a little history," the student is sometimes told, "but steer clear of anything to do with divisions of styles. All art is one; therefore all Gothic architecture is one, and it is criminal wickedness to attempt to divide it." Advice of this sort in many cases cannot possibly be attributed to any dislike or contempt for the kind of architecture in question. It is principally based, I believe, on a misconception, which it seems worth while trying to explain. In most branches of knowledge, if not in all others, it is generally agreed that subdivision and definition are requisite in order to render learning and teaching possible. "The orderly arrangement," I have seen it expressed, "and classification of its material is necessary to the true advance of knowledge." Of course if it has to be conceded that Gothic architecture is a thing by itself, not subject to the common rules of human experience, the argument that methods like those found necessary in other arts and sciences can be successfully applied to it, falls to the ground at once. But this those who talk about a one and indivisible style have still to prove. In the meantime I prefer to believe in the sound old Roman maxim, *Divide et impera*, which may be freely rendered, "By division you will become master." If we suggest, then, that for the sake of a more intimate acquaintance with the character of Gothic building, the learner should analyse it, should consider its component parts separately and in their relations to one another, instead of only gazing on it as a whole, beautiful but incomprehensible, we must consider the means at his disposal to enable him to grasp his subject. Directions, guide-posts, and landmarks innumerable await him; but unfortunately the greater number of them, and of these the most conspicuous and most generally followed, have been set up on the wrong roads. This is, I believe, the real cause of the distrust now so strongly manifested in all definite study of Gothic. Many men have a vague sense that there is something inadequate, something unsatisfactory, in the orthodox teaching on the subject, and jump to the conclusion that therefore all teaching of it must be wrong and misleading. The idea of improving our present methods does not seem to any one worth a thought. As it is of no material disadvantage nowadays to an architect to know nothing about Gothic, the elder men either leave it alone, or go on, content with the notions about it remembered from their boyhood, thinking the whole subject so simple, so easily mastered, that everything which could possibly be known about it was long ago finally settled and laid out, cut-and-dried, leaving no room for further research or progress. But this attitude has bad results for the younger generation. There are still men, even amongst the youngest of us, who take an interest in our inheritance from the middle ages, and there is besides a much larger, and rapidly growing body outside, who do the same, and who look to us for instruction and guidance. To these architectural students, craftsmen, and amateurs, we have nothing to offer but a confused, incomplete, and largely untrue account of our ancient architecture. Shoals of books, indeed, there are, but all of them, down to the very latest, are but echoes of the imperfect description of Gothic architecture composed, and to a great extent invented, by the antiquarian *dilettanti* of a hundred years ago. Perfectly true and correct echoes of the old voices they may be, as to that there need be no dispute; but the very important consideration, that in so many ways we have now the means of knowing more than even the cleverest of our great-grandfathers could possibly attain to, has, in the general treatment of this subject, been most strangely and sadly overlooked. No wonder is it, then, that an intelligent student, turning to the recognised authorities, and, finding himself in a maze of unreal and contradictory statements, often quite at variance with the evident testimony of the buildings as well as with the authentic records of history, becomes utterly disgusted, and is tempted to say, "These things have nothing to do with architecture." Illustrations, of course, have been immensely improved, many new facts and descriptions have been added; but as to all matters of generalisation of principles and of application to practice, we are using a system which is demonstrably absurd, and which deserves to to be obsolete. I speak from a considerable experience of the actual difficulties found in pursuing this subject, which evidently oppress even zealous and hard-working students, and these remarks are entirely prompted by the desire to do something, if possible, towards smoothing the path to a reasonable understanding of it. We have stayed marking time, while in every other branch of knowledge a great advance has taken place, and it is quite time that we should bring ourselves up into line. But the remedy is not to be found in general abuse of antiquaries. Their pioneer work has been of indispensable importance. The fault lies in our having yielded up to them the duty of commanding and directing, which we ought to have exercised ourselves. Hence so many of the generally received ideas about Gothic architecture come from laymen, not from architects, with the natural result that they are thoroughly amateurish, and completely ignore the one thing which we care most about—design. We have forgotten that the proper function of our antiquarian comrades is merely to heave the lead and accurately report the soundings for our information and guidance; and not, in any circumstances, to set the course or steer the ship. To descend from metaphor to details the lay mind—even in the case of the best educated and the cleverest men—seems incapable of thinking of architecture except only as a species of superficial adornment, applied in an ascending scale of ostentation. Every imaginable question in architectural design is reduced by the average Englishman to the single, and to him all-sufficient, one of comparative richness or plainness. Thus we hear Members of Parliament and other typical exponents of public opinion treating all buildings as necessarily falling under one or other of three heads; they must belong, that is to say, to what they term the "plain" or "cheap" style, to the "ornamental" or "expensive" style, or else to the intermediate one generally known as the "handsome" style. Imbued with such ideas our lay antiquaries when, unfortunately not content with collecting and verifying facts, they took to formulating systems, naturally classified and described all our ancient architecture according to the increasing quantity of ornament, which they supposed they could recognise in successive periods.

They were practically unanimous in their division of all Gothic work into early or plain, intermediate or more ornamented, and late or profusely ornamented. There was a vast amount of discussion as to the precise terms to be used to express these distinctions, and as to the particular dates at which one should be held to have merged into another, and almost by accident the designation of the latest style, which very nearly settled down into "Florid," has come down to us as the much more architectural "Perpendicular"; but the method all round was the same; not to study the differences of design in the buildings, and trace thence the divers principles which had governed their builders, not to study the social history of the nation and learn thence the various events which had influenced its modes of building, but to start with a hard and fast, ready-made schedule of three heads, and cut, cram, maim, and squeeze so as somehow to get it filled. It was reserved, however, for a later generation, almost our own contemporaries, to carry this tripartite system to absolutely symmetrical perfection, by overriding clear historical facts, and declaring the existence of three separate styles, each exactly contemporaneous with one century of the Gothic age. Complaints of this kind may perhaps be called unreasonable or hypercritical. The books in common use, one may be told, give us quite as near an approximation to truth as we need either expect or desire. To try, therefore, how far this easy confidence is really justified, I must ask you to consider, as briefly as possible, just one instance of irreconcilable difference between views generally accepted and plain facts of history. To quote from a very well-known manual: "The change from one style to another was not immediate; it generally took nearly half a century to effect the transition, and the last half of each of the five centuries was such a period of change or transition. Buildings of the last ten years of a century generally belong in style rather to that which follows." Passing on to particulars our authority further tells us:—"In the fourteenth century the general character is of the style called Decorated; the last half of it is the period of transition from the Decorated to the Perpendicular." Nothing could be more beautifully simple and regular; but nevertheless it used to be a great puzzle to me how, if all this were true, one never met with a "Decorated" building after the middle of the century, while, without any premonitory signs of change, everything after that time was to be found designed on entirely different, indeed almost opposite, principles. No reaction in taste could by itself account for such a startling change, and from no architectural writer nor any general historian could an explanation of the mystery be obtained; indeed, none of them seemed to recognise the fact. Only after a good deal of search in the by-paths of history did I come across the clue, namely that the "Decorated" style, after an existence of only some five and thirty years, was suddenly cut short and literally killed by *The Black Death*, that awful pestilence which went near to depopulating England in the years 1348-9. Epidemics are disagreeable and unpicturesque subjects, apt to be avoided or lightly passed over by even the best historians, as this particular one has been until quite within the last few years. The Black Death, though it ravaged every corner of Britain, carrying off in a few months more than half the population—destruction compared with which even the "Great Plague" of 1665 sinks into insignificance, did not strikingly affect the general course of politics; on the surface, the current of affairs appears to flow on unchanged; but in the artistic, just as much as in the social, history of England it forms a turning-point of immense importance. All the conditions under which building was carried on were suddenly, violently, and permanently altered. Time will not allow, nor, perhaps, would you care to hear, even a brief description of the effects of this visitation; but I believe that any one who will take the trouble to study the inner history of these few years will have no difficulty in learning both how it came about that the "Decorated" style never ran its natural course of logical development, and also what were the causes of the special characteristics of its successor.

The chapter of the history of English Gothic architecture which has never yet been written is the one which shall treat of the whole matter on the sole basis of design. No one, except an architect, can write this chapter, but only one, so far as I can discover, has ever fairly essayed it—I refer, of course, to the late Edmund Sharpe. His description of Gothic building is the most architectural one which we possess, and is full of valuable suggestions; but hardly any one regards it as more than a partial success, and it has certainly not succeeded in supplanting, as its author hoped, the popular amateur version. Sharpe made a bold and original endeavour to place the study of Gothic on better foundations, but his own work was doomed to failure, because it rested only on one particular section of design, and that not in reality the most important. In seeking a key to the understanding of Gothic architecture in window-tracery alone, and grouping all buildings in accordance with that one standard, Sharpe showed that, after all, he was, however unconsciously, still under the influence of the amateur school, who saw in tracery, as they do to this day, the principal evidence of that comparative amount of decoration which they denominate "style." But if I rush in where Sharpe failed, if he feared not, to tread, I shall be in danger of the apt quotation of an ancient proverb. If any one is expecting me to say that I have got the missing chapter in my pocket, I fear he must be disappointed. But over there, in the lantern which our kind friend Mr. Wonnacott will shortly bring into action, I have collected some material which may suggest to some one how it might be written, and will, at any rate, lighten the dulness of my sermon. . . . This first slide is one which I have just had made from an MS. in the British Museum, and I do not know that the subject has ever been exhibited before. It is taken from Matthew Paris's "Life of King Offa" (Cottonian MS. Nero D.i.). The author and illustrator of this work was, I may perhaps remind you, a Benedictine monk of St. Albans Abbey, who died a few years before King Henry III., and is said to have been equally distinguished as theologian, historian, artist, poet, and mathematician. The original is an outline drawing in brown ink, measuring about 9 in. by 5 in., so that the large figures are about 4 in. high. The subject is Offa, King of Mercia, directing the building of St. Albans Abbey, and it is hardly necessary to say, the drawing illustrates a building-scene of the days of its author, and not of the remote period which he is describing. Its main interest lies in the fact that we have here an unquestionable contemporary representation of a mediæval architect, together with some important evidence as to his position and methods of work. It is worth while taking note of even the details of this drawing, because some of the most fashion-

able modern theories about Gothic architecture depend entirely upon the supposed non-existence of architects in the Middle Ages. It has quite recently been confidently stated, though apparently upon no better grounds than an *a priori* assumption, that "there never was no such person," or that, if there was, he was quite undistinguishable in any way from an ordinary mason. We have been told that he could never, like a degenerate modern architect, have been seen upon the works with his coat on—because he could not have possessed one, nor even in his shirt-sleeves, for a similar reason! Now the man before us, to consider his outward aspect first, is not of this sort. In all particulars of dress and general fashion, he bears a close resemblance to the king and his attendant. So far, too, from looking just the same as any one of the crowd of workmen whom we see engaged in their various handicrafts, he is unmistakably a man of learning and culture, whose work lies in designing and directing, rather than in simple manual labour. He is discussing, on very friendly terms, some point concerning the building with the king; the latter apparently has made some suggestion, but the architect is giving his opinion with no undue show of deference, while the courtier keeps in the background till the question is settled. Even were there no other signs to guide us, this drawing is enough by itself to suggest that a great Gothic building was not, as is so often pretended, a mere concretion of material, piled up by the unorganised and undirected labour of many similar units—exactly in the manner of a coral reef—but was, on the contrary, the actual creation of a single intellect, as truly and absolutely so as a play of Shakespeare or an oratorio of Mendelssohn. There is not in reality the slightest disparagement of the other workers who took part in raising such a building in saying that their work could not have come into being without an original mind to give the necessary impulse and control; it is no more than saying that the cleverest actors and the most skilful musicians depend after all for the opportunity of exercising their powers on the previous labour of the individual dramatist and composer. When we know that Matthew Paris not only witnessed important building operations in his own abbey, but was in great favour with Henry III., and present at his court during the erection of the Abbey Church of Westminster, we may readily imagine that in representing the legendary scene of Offa's foundation of St. Albans, Paris drew upon his recollections of the frequent interviews he must have witnessed between Henry and the architect of the great church, in the building of which the king took such deep and constant interest. But notice also this architect's compasses and square—they denote more than that he is merely an expert in building—they mark the geometrician. This is a point we must return to, after looking at the other slides, views and details of buildings, selected for special reasons, which, for convenience' sake, must be shown now. . . . To come back now to Matthew Paris's drawing. Here we may find the clue, without which we can never learn to see the mind of the mediæval architect in his work. He was essentially a geometrician. In the great intellectual movement of the thirteenth century, no branch of learning, except theology, was more widely cultivated than geometry; and this science, both then, and for long afterwards, occupied an altogether higher position relatively to other intellectual pursuits than it does at the present time. Among the many side-lights which the recognition of this fact seems to throw upon the development of English architecture is one with regard to the vexed question of influence from the East. Most people have at some time felt, if they have not, through lack of tangible proofs, actually allowed, that Oriental suggestions must have played some part in the formation of English Gothic architecture. As an explanation of this, it has generally been loosely asserted that the English crusaders tried to reproduce at home the Saracenic architecture which they had seen and admired in the course of their campaigns; a supposition which, besides being unsupported by a shred of evidence, must seem to any one acquainted with the average military mind, absolutely incredible. But when we think of the highly-prized Arabic geometrical treatises then finding their way into every monastery and university (the latter being at the time thronged by lay scholars, in numbers almost impossible to realise), there is little difficulty in imagining how the subtle influence of books, written by men whom the most learned of Europeans reverenced as their intellectual masters, became the means by which Oriental inspirations were grafted upon the rising tree of English architecture. Until we can form some idea of the influence of geometry during the middle ages, nowhere stronger, I believe, than in our own country; until we can partly realise the fascination in the study and exercise of it which then possessed every educated mind, lay and clerical alike, we shall never be able to understand the conditions under which our Gothic structures were designed. Geometry is the indispensable key to the thoughts of the men who built them; indeed, I will go so far as to say that, were I asked to define English Gothic architecture in the fewest possible words, my definition would be:—"A species of building wherein every part, from the greatest to the least, is dominated by the same geometrical motive?" I beg you to notice, however, that I do not say, simply, "dominated by geometrical motives," nor "by a motive," but "by the same motive." A great deal turns upon this. It will not be at all surprising to hear this definition objected to as being neither new nor true. It may be contended, on the one hand, that everything possible to be said about the connection of geometry with Gothic architecture has been already said; and, on the other, that true art soars far above the trammels of such a cold, hard, prosaic science. Both objections cannot be dealt with together. The former, of course the less important, may perhaps be sufficiently answered in a few words; but, to establish a case to meet the latter, which I expect would be fervently urged, would require the production of a large body of pictorial and other similar evidence, such as, unfortunately, I am unable to bring before you in the limits of the present paper.

But there may still be time to say a little about previous references to the relation of geometry to Gothic design. The mention of it at once calls up visions of plans and sections of churches, crossed over like maps by squares and triangles, with arguments on the supposed rules of their setting out, which have rarely succeeded in carrying conviction, chiefly on account of the apparently arbitrary and usually contradictory systems of measurement adopted by rival theorists. It suggests also that much ingenuity has been devoted to one particular class of geometric design by the illustration of the infinite variety of patterns producible from contained and intersecting circles. Nor will it be forgotten that some authorities have gone so far as to speak of a "geometrical period," though only as a short-lived minor division of English Gothic. We may be grateful for hints from all these sources, but they neither exhaust the subject nor give us the information for which we seek. It should be remembered that, owing to the general destruction of our ancient libraries, and the consequent dearth of direct home evidence, people have been implicitly relying upon certain works on proportion, which happen to have come down to us from German and Italian architects of the latter part of the fifteenth and of the sixteenth centuries, to explain the principles of English architecture in the thirteenth and fourteenth centuries! To arrive at an understanding of the actual manner in which Old English architecture was influenced by geometry, not for a limited time only, but from its birth to its decline; not through any one form or figure only, but through many; not vaguely and at random, but with a single order of forms dominating, as a key-note, each particular era in succession, and quickening inert matter by the inspiration of an intellectual force, we must discard many old methods, old prejudices, old associations. We must look for new facts in our own buildings, and for new light upon them from our increasing knowledge of own social history. We must establish our principles solely upon the firm base of careful observation, instead of stubbornly dogmatising in the old, vicious manner, and mangling facts to make them square with unwarrantable theories. In doing this we may gain even more than truer and fuller knowledge of the past; we may find sure helps and great encouragement for the future.

---

The Chairman said that when he observed the title of Mr. Flower's paper some time ago he regretted that it did not define its subject more clearly, but now he was quite convinced that Mr. Flower had done the right thing. The paper was very suggestive, though at the same time he was afraid it would be difficult to discuss it. Mr. Flower's line was new, but there was something about it to his mind which carried a conviction of its truthfulness. He could not explain why he thought that, but it seemed to him that the theory was extremely probable. It seemed that a link was missing, as Mr. Flower had so characteristically described, in history books of architecture, and this link he hoped Mr. Flower had found. They had for some time been accustomed to talk about Mediæval architecture as a sort of sanctified engineering, and some of them did not consider that any reflection was cast upon Mediæval art in that definition. Mr. Flower had certainly carried that belief to a very practical point, as his studies had convinced him that the whole progress of that art, their national art, up to the time of the Renaissance, proceeded on geometrical lines, or a system of geometry applied to a particular building and existing for the furtherance of that building. He expected that an engineer would give them practically the same definition of the motive underlying any modern work of engineering. He proceeded upon a geometrical method, and certain scientific factors which were found mainly in his materials; and it seemed to him (the speaker) that his method was exactly the same. A more interesting prospect certainly was thus opened to them than the prospect of a barren geometrical investigation of works that were to them works of sentiment and romance, in the singularly beautiful way in which the æsthetic sense was combined with the geometrical engineering, as the essence of the evolution of their architecture. Oh, that they might learn the lesson, and be more geometric! and that engineers might learn the lesson, and be more æsthetic! He (the speaker) listened carefully to the opening of Mr. Flower's paper, and noted how carefully he dealt with the architectural history books, and also with their critics; and it seemed to him that Mr. Flower would undoubtedly have to write the new history of English architecture; and no doubt, in arriving at the conclusions which he had given them that night, he had collected the material necessary, at all events, for an efficient handbook to the proper and effectual study of a developing architecture. The portrait of the Mediæval architect that he had discovered and shown upon the screen would no doubt mark that meeting as historic. They might think he was unduly exaggerating the importance of this discovery, but he believed that the point would receive, through the publicity it would gain in the press, the attention it deserved. To have unearthed from the British Museum a thirteenth-century architect addressing his client, and having in his hand, not a two-foot rule or a five-foot rod, or a bill of quantities, but simply a revolving calliper, was a discovery of no little importance. Similar testimony to that afforded by the illustration which Mr. Flower had exhibited was borne in the celebrated album of Wilars d'Honecourt, in the Library of Notre Dame, Paris, which was produced in facsimile by a French architect, and of which Professor Willis issued a translation. That book proved that architects existed as architects and as draughtsmen—there was no evidence of a draughtsman in the illustration shown that evening. The draughtsmanship in the album he referred to was interesting because it was geometrical, and because the geometry was carried to the extent of drawing the human form, and showed how to design the figure in triangles. The designer also sketched in a wiser way than we did. We sketched things as we saw them, while this travelling architect of the thirteenth century (about the same date as the architect exhibited that night) sketched as he thought things ought to be. That was vastly interesting; for instance, he sketched the west window of Laon Cathedral, not as it was, but as he thought it should be. In conclusion, he (the Chairman) would like to refer to a matter of some interest, and that was the way in which the Black Death removed the tenderness of our national architecture. After that the Deluge, the Perpendicular, and then no life, no feeling, "no nothing," until the Renaissance.

Mr. Paul Waterhouse, in proposing a vote of thanks to Mr. Flower, said he congratulated the Association upon the excellence of the paper they had heard that evening. It was very difficult to open the discussion upon it, however, since it was a paper by a specialist, Mr. Flower having devoted so much careful study to Gothic architecture. He felt that in suggesting more system in the study of Gothic architecture, Mr. Flower was doing them, as students, great service. They had long been accustomed to complain that the recognised divisions, chronological and formal, of Gothic architecture were misleading—in fact, that they hindered as much as they helped; and he supposed that the great difficulty in the study of the subject arose from the fact that Gothic architecture, when they were first led up to it, was chaos, and a young student could not make much

out of it; the only way was to divide it up, as Mr. Flower had said. It unfortunately happened that the first divisions were done by persons who had only a very partial view of the subject, and those divisions were taken up and elaborated by various antiquarians. Moreover, these divisions, even if they were of the best description, had in each student's education only a temporary purpose. Granted, for the moment, that the anatomy, the analysis of Gothic architecture, had been as good as it could be, Gothic architecture was so complex that these divisions must, after having first served to illustrate the subject, have tended to obscure it. It would be impossible to so divide the subject of Gothic architecture so that the divisions would not become, after increased study, a kind of obscuration. He thought that must be granted as inevitable. They knew to their cost how very much those conditions hindured. People imagined that the periods of Gothic architecture existed as clearly in actual fact as they did in text-books, and no one could do a greater service to students of Gothic architecture than to point out to them a higher consideration of the subject. The divisions should enable the student to approach the matter with a clearer set of ideas. It had often been a matter of astonishment to him that they were so unable to criticise a Gothic building. He knew hardly any one who had such courage in his convictions as to adversely criticise a building of earlier date than the fourteenth century; but it was inevitable that some buildings of that date which had survived could be criticised. In regard to the way in which first principles were laid before young architects, he believed that in the true evolution of an architect (by which he meant a designer), first principles should not come first. He believed that the first process of growth in an architect began by the study of everything that came within his province as an architect. Secondly, the canons of taste were not rules of proportions, or rules laid down by a Ruskin, but something in themselves which, the more powerful it was, the more difficult it was to define. That must be cultivated in every individual architect after the study. They would find springing up in themselves laws which were principles, by which they obtained the power of criticism—criticism of other buildings, and criticism of their own designs. As to the ancient architect, an illustration of whom had appeared on the screen, he did not appear to have any india-rubber, and he (the speaker) was inclined to think that india-rubber was one of the chief factors in design. Perhaps it would not be altogether incorrect to say that in many men design consisted in the power of mercilessly criticising their own productions, and there were many excellent designs which, instead of taking form at once, were rubbed into shape by india-rubber. He was not prepared to discuss at that time the question of whether the geometric principle was the great secret of Gothic design.

Mr. W. H. Seth Smith seconded the vote of thanks to Mr. Flower for a paper which, he said, represented a vast amount of work. Mr. Flower's paper might be described briefly as a scientific paper—that was to say, it was scientific in its historic method. The illustration which Mr. Flower had obtained from the British Museum was of quite exceptional value and, as the President had said, it would mark an epoch in the information which they had on the subject and would rather shatter the idea they heard so frequently expressed that in the Middle Ages there were no architects—an idea which was very popular just now, and which threatened great harm to young architects in their training. He thought the paper, and Mr. Flower's statement of the geometrical origin of Gothic architecture, brought into prominence the idea which was now very often discussed and which appeared to the speaker to have very great weight, viz., that they as architects required much more scientific training—much more training in the direction of engineering science—and that they needed to have not only the artistic power, but also a thorough training in those principles upon which such a constructive art as theirs was based. The paper, which he imagined would be opposed very energetically by men like Mr. Ruskin, was, he hoped, only an instalment of a larger work by Mr. Flower on the same subject, and that they would have from him further papers which would lead them to study more scientifically the styles of English architecture.

Mr. A. H. Hart, in supporting the vote of thanks, said that he was a little unable to grasp the full meaning of Mr. Flower's theories. He had told them that geometry entered very largely into the designing of mediæval buildings, but he (the speaker) would like to see that theory carried a little further. Did he understand the lecturer to think that geometry was responsible for the many beauties of mediæval architecture? If that were so, a great deal was being attributed to geometry. In regard to the draughtsmanship of the Middle Ages, he had the opportunity recently of inspecting the original design for the west front of Orvieto Cathedral, and an interesting drawing it was. Not more was shown than was absolutely necessary to direct the workmen, and that only in a very sketchy way. Some parts of the front of the cathedral were entirely omitted: the metal work for instance—the lions and so forth—which added very greatly to the beauty, was not shown upon the drawing.

Mr. Banister F. Fletcher, in supporting the vote of thanks to Mr. Flower, said that the lecture concluded with the geometric idea, which had surely been well threshed out before in connexion with Gothic architecture. Any one who desired to know what had been written on the subject had only to refer to Billing's "Infinity of Geometric Design" and he would see how much geometry must have entered into the design of Gothic structures. It was a fact which he supposed every one would admit, but could it be stated on every page of an architectural history book? Mr. Flower had also taken exception to the formidable list of dates which were contained in some history books, but could a history of architecture be very well written without them? The Board of Examiners of the Institute asked for the dates, but if Mr. Flower, as one of the examiners, would get those gentlemen to eliminate dates from the examinations he would have a large following of students. As to the important point of the laws of mechanics in relation to Gothic architecture of the Middle Ages, it seemed to him that they must follow the history of architecture in the Gothic ages as a history of construction, the different forms which were evolved being nearly all traceable to constructive principles. Mr. Flower had done well to enforce that. It was not so much a question of design as of construction which architectural students ought to consider. As to the public understanding design, he thought they did a little until last year, when he heard the west front of Canterbury likened to St. Paul's. As to the divisions of Gothic architecture, he agreed that it was ridiculous to refer to "Early English" and "Perpendicular," but what were they to do? A line must be drawn somewhere, for they could not talk about Gothic architecture as a whole—at least the student could not. They were told that the sub-divisions were absurd, but they must be mentioned in books. Sharpe, however, took one feature, the window, and he made the whole of his system depend upon that: whereas, as a matter of fact, the system of window tracery was almost entirely brought about by the system of vaulting. If Sharpe had taken the buttress and the vaulting, and made his system depend on that, he would have given a more satisfactory definition of Gothic architecture. He thought that Mr. Flower had overlooked the fact that the crusaders were the most intellectual men who went abroad, and that the engineers of the army were quite likely to adopt any Oriental features. For the intellectual study of English architecture, a good history of England should be read at the same time, and he would suggest a careful perusal of Green's "Short History of the English People." The speaker's pet idea was that engineering was a part of architecture, and that the more they got away from the true practical building the less likely were they to get a style which was essentially characteristic of their period. During the whole Gothic period, as far as could be understood, the men who built were practical men—they were not paper draughtsmen—and that was the true secret of all architecture. The true modern architect he regarded as an engineer. Mr. Flower had spoken against the triangulation of the English cathedral, but he had not ventured to put anything in its place. There was one matter which ought to enable Mr. Flower to get over his objection to text-books, and that was the article written by Violet-le-Duc on "Construction." That was a most valuable discourse—a scientific, a builder's discourse—on the development of Gothic architecture. There were no divisions, and that would enable Mr. Flower to get over his objection to divisions into periods. The English translation lately published could be obtained from the Library. He could not help thinking that Gothic architecture was really the best architecture for any student to study; whether he was going to design in Gothic or not, it was a study in construction. Any one who measured up a cathedral edifice from top to bottom, and reasoned the building out on paper, would find the work an architectural education in itself, even if he did not agree with the ideas or the principles of the style.

The vote of thanks having been put and carried unanimously,

Mr. Flower, in reply, said that, in regard to the suggestion that he should give a further instalment on the subject of his paper, he had no idea of doing so—at least, at present. In regard to Mr. Hart's remarks about geometry, of course a very hard view of geometry indeed could be taken. He (the speaker) would not say that geometry was a royal road to good architectural design, and he did not suppose that any Mediæval architect rigidly insisted upon it. He did not assert that those architects were fully conscious of definite motive in what they were doing—the English, at any rate, for the French architects were more logical. But certain leading ideas were perceptible not only in tracery and in mouldings, but even in carved and painted work; no division that only regarded tracery would enable them to understand the preferences for particular classes of forms which seemed to have influenced those architects. But it was a subtle influence much more easy to feel and recognise than to rigidly define. Mr. Fletcher had criticised his remarks recommending students not to trouble themselves with historical data, but those remarks were contained in a paper written years ago, from which he had quoted: his views had been modified since. As to the text-books, why was it that the public took their views of English architecture so implicitly from Parker? Chiefly, he believed, from his prominent position as *the* bookseller and publisher at Oxford; he had done much excellent work as an antiquary, but were it not for these other causes his theories would never have attained to such prominence. He did not desire to say anything against Mr. Parker — in fact, he admired him very much as a man who knew a great deal, but he was not an architect. Another similar book was that by Mr. Bloxam, a country solicitor. He, too, was a most estimable man, and though there was no objection to such men writing on the subject, it became a serious matter when, upon the imperfect systems constructed by them, architectural students were instructed and even examined. He (the speaker) was well acquainted with Mr. Billing's books, but could not discover in them any principles except those relating to the use of circles. As to the architecture of the Middle Ages his view was that during a certain number of years men preferred to work mainly on circles; at another time on triangles, and at others on more complicated systems; but no one system could be got to include the whole of the Middle Ages. He was quite in agreement with what Mr. Fletcher had said in regard to the laws of mechanics, as well as with what he had said about the necessity of divisions. It was only a question of why and where they should draw their lines. One text book, for instance, said that the flowing line began to be used *after* the middle of the fourteenth century, which was directly contrary to the facts. As to the crusaders, he did not agree with Mr. Fletcher, for many of those men could not even read or write, and a man who could not read or write had seldom much idea of form; he would be just the kind of man who, as Mr. Fletcher had told them, could see no difference between Canterbury and St. Paul's. As to Green, they must remember that his history was written more than twenty years ago, and they must seek newer authorities to get at the real facts of the great social changes which happened at the period they were discussing. The Black Death having carried away half the population, the only important works carried on for some years after were the royal buildings at Windsor, and for these William of Wykeham had to impress workmen from all over the country. The necessity of employing quarrymen and hedge-carpenters to take the place of trained craftsmen, in consequence of the enormous mortality in the crowded cities and monasteries, was an architectural factor of considerable importance. It took England centuries to recover from the shock of this plague. He admired Pullan's work to some extent, but his principles of proportioning did not tell them all they wanted to know. He did not think that the sculptors and masons of the Middle Ages understood thoroughly the principles which it was interesting to try to trace in their work; but they had some sort

of motive, or there would not have been so much similarity in their work all over England at the same time. He agreed with Mr. Fletcher that Viollet-le-Duc's article on Construction should most certainly be read by the student; he would also include his Lectures on Architecture.

The Chairman annnounced that the next meeting would be held on the 19th inst., when a paper would be read by Mr. W. H. Bidlake on "The Architect and the Public.

The meeting then terminated.

## MAGAZINES AND REVIEWS.*

THE *Art Journal* is almost entirely devoted to painters and their works. The principal illustration is an etching, by Mr. David Law, of Corot's "Souvenir d'Italie," accompanying a poem on the artist by Mr. Arthur L. Salmon. Mr. Cosmo Monkhouse continues his description (begun in the January number) of Mr. Arthur Sanderson's artistic treasures, the present paper giving an account of "The British Portraits" belonging to this notable collection. "A New Colour Printing," by Mr. Gleeson White, describes a lately developed invention, employed in a factory at Deptford, for producing colour printed fabrics on a very large scale and with wonderful mechanical exactness; the specimens illustrated are hardly satisfactory as examples of design, but there is no opportunity of judging from them of the actual colour effects produced by the new process. Mr. Lewis F. Day contributes a somewhat pessimistic article on "Art in Advertising," with some characteristic illustrations. He offers some practical advice on designing advertisements, but seems to be of opinion that the conditions of advertising are necessarily antagonistic to Art. "The better the picture," he concludes, "the less it is suitable to advertisement. Good pictures do not shout; and advertisement, when all is said, means shouting. It resolves itself very much into a question as to who shall shout loudest, and so drown the voice of his competitors." "Holbein's Porch," written and illustrated by Mr. G. Fidler, describes a pretty little fragment of architecture, now standing by itself in the gardens of Wilton House, but formerly at the entrance to the mansion. Mr. Fidler gives, at some length, the grounds for its attribution to the great painter. The drawings are rather weak, and somehow convey an impression of the whole thing being executed in white plaster. An article, signed "G. B. B.," on the work of Tito Lessi, is illustrated by some excellent photographs of some of his best pictures, which go far to substantiate the claim made for him of being "An Italian Meissonier." Mrs. H. M. Stanley gives some personal reminiscences of Bastien Lepage and his visits to London, of which some of the most interesting are the painter's observations on the particular "notes of colour" respectively characterising Paris and London, and on the difference in "tone" of the English atmosphere. The new Central School of Arts and Crafts is criticised by "L. F. D.," some of whose remarks are worth consideration. "It is surely the greatest possible mistake," he says, "to shut out from them all but those *actually* engaged in the particular branch of the industry taught." Distribution of labour "has, in great part, to account for the present unsatisfactory condition of things; and if, for example, trades like silversmithing are to be brought into line with the artistic movement of the day, the first thing to be done is to break down the trade barriers dividing them into half a dozen sections, each of whom knows nothing of what the other is about. The real need among workmen (though they may not know it) is that they should understand something more about their handicraft than pertains to the small section of it to which they are confined in the factory. The London County Council seems to stand too painfully in awe of the trades unions to do the good work it might do with the funds at its disposal." The exhibitions of pictures by Lord Leighton and by Mr. Watts receive short notices, with illustrations of the "Procession of Cimabue's Madonna" of the one, and the "Chaos" of the other.

To the *Nineteenth Century* Prince Krapotkin contributes a comprehensive survey of "Recent Science," which includes a summary of our present knowledge of the "North Polar Basin," as modified by the results of the Nansen expedition.

In the *Contemporary* Mr. W. H. Dickinson, under the head of "The Water Supply of London," makes a vigorous attack upon the present water companies, which he contends ought to be abolished. He would not be content with any middle course of exercising fuller control over their administration, or of establishing a Water Trust; "the only logical solution of the question," he sums up, "is to place the water supply entirely in the hands of the proper representative bodies." Mr. Edmund Gosse, by his "Coventry Patmore, a Portrait," reminds us of an author, who, although he seldom touched on architectural matters, did so at times, in his prose essays, with a rare union of enthusiasm with discrimination. The poet's "ceaseless pre-occupation and daily delight" for several years in watching the growth of the church built for him by Mr. Basil Champneys at Hastings is graphically described; it is interesting also to notice the efforts which he made to get really first-rate statues into the churches of his communion, to supersede "the wretched Munich things Catholics now have to put up with."

"Vanishing Paris," in *Macmillan's Magazine*, is a doleful lament over the continuing process of "Hausmannization," which is reducing all Paris, says the anonymous author, "to a criss-cross of straight lines." It describes the havoc among the old associations of the Faubourg Saint Germain now taking place, owing to the construction of the new Boulevard Raspail, and gives some graphic descriptions of the fallen greatness of the once splendid mansions of the Rue Galande.

The *Gentlemans' Magazine* contains an account by Mr. E. H. Parker of "The Emperor of Annam and his Capital," from which some idea may be formed of the general aspect of Hué, the capital, and other Annamese cities. There is also a full review of Miss Phipson's new work on "Choir Stalls and their Carvings."

In *Temple Bar* we find "The Dome and its Wanderings," by Mr. J. C. Paget, a popularly-written account of the geographical distribution and general history of domical building. Several of the most famous domed structures at Constantinople, Venice, and Agra, are described from personal recollection.

The *Fortnightly Review* contains a short article by Mr. H. H. Statham on "Leighton and Watts: two ideals in Art," comparing Lord Leighton's and Mr. Watts's use of the figure as a medium of expression in Art, and condemning Mr. Watts's tendency towards mere moral symbolism in some of his later pictures.

The *Cornhill* contains an article by Mr. E. T. Murray Smith on "Two Centuries of National Monuments"—to wit, those in Westminster Abbey; rather historical than artistic, but summing up with the opinion (in which we quite concur) that however some of these monuments may offend against art and good taste, we have to accept them as they stand; "One generation cannot lightly undo the knots tied by those before it." The *Cornhill*, under its new management, has not dealt much with subjects which come properly under our criticism, but we are glad to take this opportunity of expressing our sense of the varied interest of its articles since its new start, and we would particularly mention the series called "Pages from a Private Diary" as including much admirable and witty criticism on contemporary events, by an evidently shrewd and original mind.

"Chatsworth," in the *Pall Mall Magazine*, by Mr. A. H. Malan, with illustrations from photographs by the author, is evidently written for the sake of the photographs, and does not aspire to be more than a pleasant and appreciative chat about the principal "lions" of the place; the prints are mostly clear and good. "The Cathedral," written and drawn by Mr. G. M. Henton, is a little descriptive poem, in obvious imitation of Longfellow. The verses are interspersed with sketches from various places.

In *Knowledge*, Miss A. M. Clerke's "Sixty Years of Astronomical Research," is accompanied by a sketch-elevation of Vienna Observatory, described beneath as "An Ideal Establishment, such as we might have, but have not in England." The building, with three bold domes, and conspicuous telescope-apertures, looks both sensibly and gracefully designed and thoroughly appropriate to its object. Mr. W. H. S. Monck's letter on "Underground Cavities and Streams in Ireland" is of some geological interest.

The *Quarry* has several useful articles and notes in particular on "Variability of Building Stones;" "The Bolsover Fire," and the effects of high temperatures on stone; "Slates and Slating," a fresh and sensible treatment of an old subject; and "Tests of Sands for Making Mortars," translated from a paper by M. R. Feret.

The *Antiquary* devotes a good deal of its space to making common cause with certain Radical journals in their desire to "rescue" English cathedrals from their clerical guardians—a strange combination! In language by no means of the sober and temperate sort to be expected from such a quarter, for the sake of the possible preservation *in situ* of a certain quantity of old masonry, the entire destruction of a far older institution is demanded, and with a childish display of ill-feeling, a photograph (a very poor one, by the way) of the west front of Peterborough is reproduced, for the small satisfaction of printing below it: "Now in course of Demolition"!—a statement which can only be characterised either as foolish ignorance or direct untruth. Miss Sophia Beale begins a series of gossipy, popular articles, entitled "Gleanings from French Churches."

*Harper* includes several interesting articles. Under the fanciful heading of "Hygeia in Manhattan," Mr. R. Wheatley gives a scientific and statistical account of the character, functions, and methods of the New York Board of Health. Mr. T. Hastings' "Architecture and Modern Life" is a thoughtfully written essay on some aspects of contemporary American architecture, dealing chiefly with the influence of French Renaissance models, which the author would like to see generally followed, but with freedom and discretion. "Poor Sir John Vanbrugh, one of England's greatest architects, whose charming floor-plan of Blenheim Palace will be admired for all time to come," comes in for some unusual and unexpected praise. "The Awakening of a Nation," by Mr. C. F. Lummis, has some capital views of Mexican cities.

In the *Century*, Mrs. Van Rensselaer's illustrated article on "Places in New York" is chiefly of social and ethnological rather than of topographical interest.

The same may be said of "London," in *Scribner*, by Mr. C. D. Gibson, the illustrations being devoted entirely to types of character from the streets. The works of Guiseppe Segantini, the Italian landscape painter, are described by Sig. Alfredo Melani; and in "The Field of Art" a description, with a sketch, is given of Tilgner's newly erected monument to Mozart at Vienna.

The *Atlantic Monthly* contains Miss Robbin's account of the excellent work done by the "Village Improvement Societies," founded to plant trees, lay out parks, &c., in many villages and towns in New England. The decorative paintings just completed by M. Puvis de Chavannes in the Boston Public Library are described by Miss Waern. Under the title of "Two Interpreters of National Architecture," Mr. H. Van Brunt gives a careful and interesting review of the lately published biographies of J. W. Root and Charles Bulfinch.

The special issue of the *Engineering Magazine*, entitled the "Prosperity Number," is a well got-up number, devoted chiefly to topics of mechanical engineering. Mr. Dankmar Adler treats of "The Stimulus of Competition in Architectural Construction," regarding all advancement in architecture as the result of competition, first among individuals, and afterwards between communities, and calling on architects "not to fail to bear their part in the progress and work of the day, and in the competition and emulation to surpass one another, which lies at the foundation of human progress."

*Le Monde Moderne* contains prettily illustrated general descriptions of Bucharest and Nice, and some good specimens of "picture-making" by photography from the exhibition of the Paris Photo Club.

*La Revue Générale* contains M. Arthur Verhaegen's concluding article on Trades Unions in Belgium, strongly advocating their legal recognition. A new illustrated work, "Les Grandes Cathédrals du Monde Catholique," by M. L. Cloquet, Professor of Architecture in the University of Ghent, receives very favourable notice.

In the *Architectural Record* the principal article is a somewhat profusely laudatory account of the works of Mr. H. J. Hardenbergh, a designer of "mammoth" hotels and "sky-scraping" blocks of offices. Mr. Goodyear continues his ingenious, if unconvincing, researches into the "constructive asymmetry" of mediæval Italian churches. Some cathedrals of Provençe are described in a well illustrated article by Mr. Barr Ferree, and other articles deal with "Corner

* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.

Houses in Paris," "The Villas of Rome," "Sicily," and "Modern Decoration."

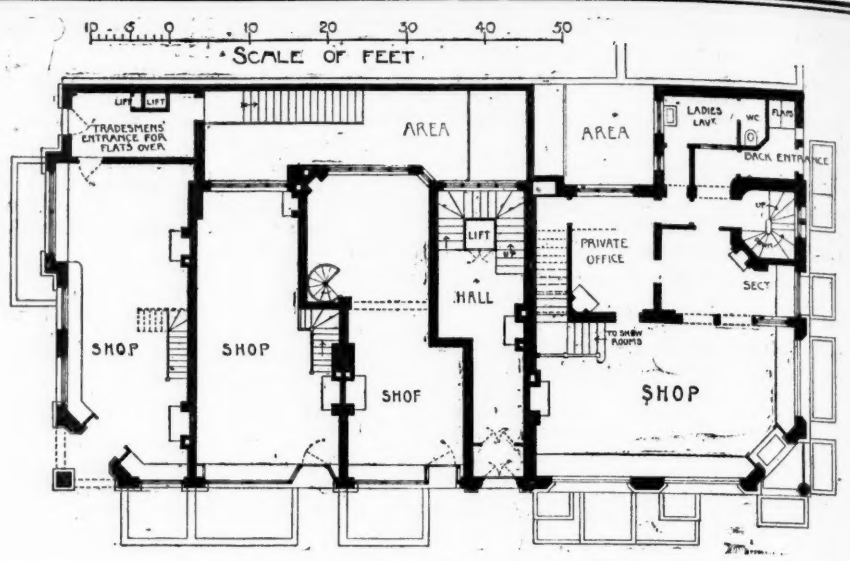
The *Engineering Magazine* has a suggestive criticism of the architecture of American Government buildings by Mr. W. M. Aiken, the variety of types illustrated being specially interesting. Mr. G. E. Waring, Jun., discusses the "Relations of Street-cleaning to Good Paving,"

## *ARCHÆOLOGICAL SOCIETIES.*

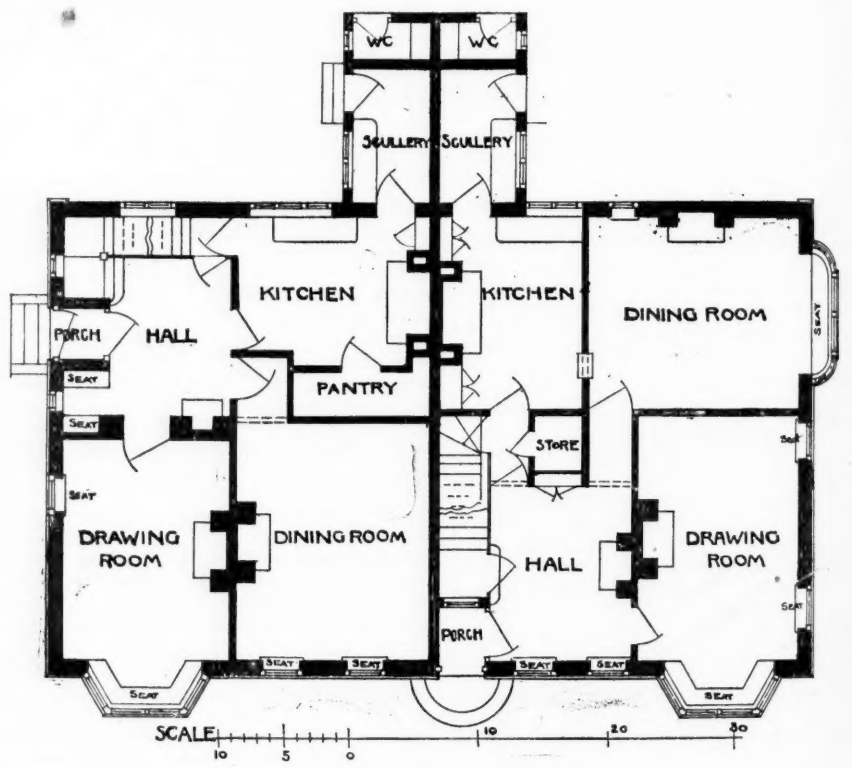
SOCIETY OF ANTIQUARIES.—A meeting of this Society was held on the 4th inst., Sir H. H. Howorth, M.P., V.P., in the Chair. Mr. James Harrison exhibited and presented a photograph of a stone shaft, surmounted by a small bowl, evidently a holy water stock, lately rescued by him from the churchyard, and now in the vestry of St. Andrew's Church, Charmouth. Rev. Canon Church exhibited a remarkable thirteenth century wooden pix canopy, from Wells Cathedral, upon which Mr. W. H. St. John Hope read some descriptive remarks. The canopy is in the form of a cylindrical lantern of open tracery work, and is about 4 ft. in height. Though much "restored" it bears traces of having originally been richly painted and gilded. The top is surmounted by a bold cresting of leafwork, and retains the curiously arranged ironwork by which the whole was suspended with a swivel hook from which the pix depended. Mr. C. Lynam exhibited a cast of, and communicated a note on, a fragment of a pre-Norman cross-shaft lately discovered at Leek, Staffordshire. Professor T. McK. Hughes read a paper on "The Derivation of the Four Characteristic Implements of the South Pacific," namely, the battle-axe, the throwing-stick, the boomerang, and the patoo-patoo, and he showed, from actual comparison, there were strong grounds for believing that they had directly derived their present forms from the bones of *cetacea*.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The fouth meeting of the session of this Association was held on the 20th ult., at the rooms in Sackville-street, Piccadilly, Mr. C. H. Compton, V.P., in the chair, when a paper by Dr. Fairbank, F.S.A., on "Portable Altars" was read, in the author's absence, by Mr. Patrick, Hon. Sec., illustrated by sketches made by the author. A lengthy discussion on this very interesting subject followed, in which Mr. Dobson, the Rev. Cave-Browne, and others took part. On Wednesday, the 3rd inst., the fifth meeting of the session was held in the rooms in Sackville-street, Mr. Thos. Blashill, Hon. Treasurer, in the chair. A most interesting exhibition of prehistoric implements was made by Mr. G. F. Lawrence of Wandsworth, including a unique specimen of a weapon of stag's horn still retaining its wooden handle, thought to be of blackthorn, which was recently found in the Thames at Hammersmith. This must have been a very effective weapon, from the toughness of the horn and the pliancy of the handle, in a fierce hand-to-hand combat. In the course of his observations Mr. Lawrence remarked that in the Yorkshire pile dwellings, and in a few instances in the Thames, the leg bones of oxen and other large animals had been found which had been used in a similar manner, but the greater difficulty of fixing the bone in order to secure it to the handle must have made the use of the stag's horn more general. This example is supposed to be about 3000 years old. Mr. Earle Way exhibited two specimens of Cyprian pottery and a whistle, together with a pretty little model of a quern in soapstone, and a bronze bracelet from Egypt. Mr. Hoyle exhibited a translucent jade earring from New Zealand, about ten miles from Christ Church, the hole in which had been made by a stone instrument close to the edge, but yet without in any way injuring the jade. Mr. Patrick, Hon. Sec., read a short paper descriptive of the discovery of a Roman house at Burham, in Kent, upon the property of the Burham Brick, Lime, and Cement Company, which, by the Company's invitation and generous assistance, Mr. George Payne, F.S.A., of Rochester, and himself had recently had the opportunity of disinterring. The house is a small one, measuring about 60 ft. by 34 ft., but possesses a very perfect and unusual form of hypocaust. This consists of a system of horizontal flues cut in the chalk subsoil, and running round all four sides of an apartment measuring about 18 ft. by 16 ft. These flues connect with a central and two radiating flues from the mouth of the furnace, the central flue being large enough for a boy to crawl through; the others varying in diameter from about 13 in. to 8 in. or 9 in., where they joined the wall flue. At intervals round the walls were eight or nine recesses, in which vertical wall flues, ranged in pairs, carried the hot air and smoke to the roof. Some of these were found *in situ*, the remains of others lying in the bottom of the shaft. Remains of pottery, tiles, bones of animals, and portions of coloured plaster decoration, and one small bronze fibula, were found. The house appears to have been one of the smaller and less pretentious kind frequently met with along the line or in the immediate neighbourhood of the principal Roman roads in the south of Britain. The paper was illustrated by plans and drawings from sketches made and measured on the spot by the author, and by numerous photographs taken by Mr. Payne of the various features and phases of the excavations. The next meeting will be on February 17, when a paper will be read by Miss Edith Bradley on "London under the Monastic Orders."

ENGINEERING APPOINTMENT, LITTLE DON WATER SCHEME, SHEFFIELD.—On the 3rd inst. the Sheffield Water Committee met at the Town Hall to finally select a Resident Engineer to take charge of the work of the Langsett reservoir, in connection with the Little Don Water Scheme. There were originally thirty-two applicants for the post, and out of this number six attended before the committee recently, when the list was further reduced to two. The committee resolved to recommend the City Council to appoint Mr. Wm. Watts, of Oldham, at a salary of 1,200*l.* per annum.




*New Premises, Duke-street. Ground Plan.*




*Houses, Headingley, Leeds. Plan.*

# Illustrations.

## GATES, SHEFFIELD MUNICIPAL BUILDINGS.

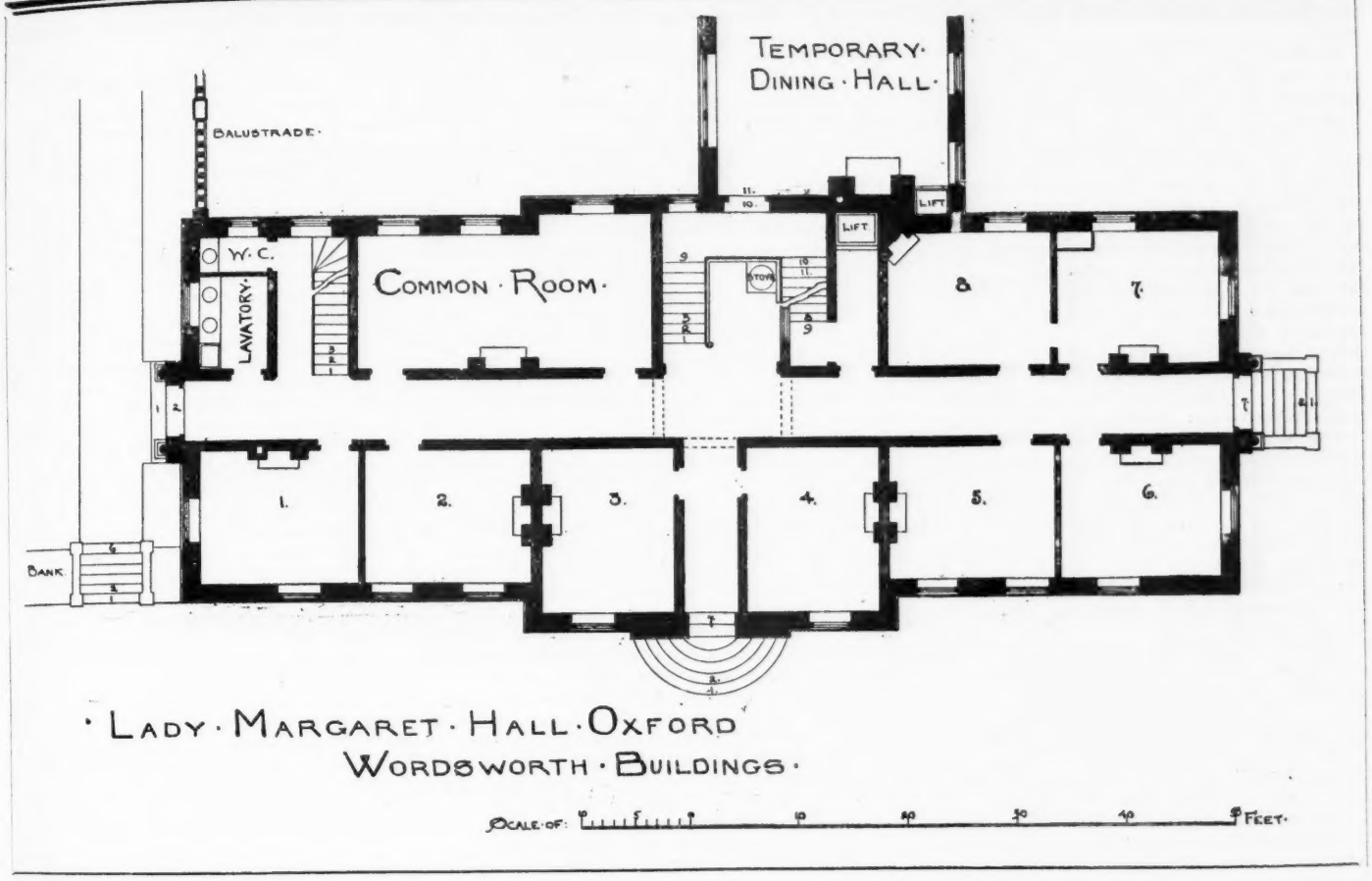
THIS drawing represents the gates of the main entrance to the new Municipal Buildings. The work was carried out to Mr. E. W. Mountford's design by Messrs. J. W. Singer & Sons, of Frome. The upper portion is a fixed grille with the city arms painted in heraldic colours, and the gates slide into a groove in the wall. They were made in forged iron throughout. The gates, which will be opened by her Majesty the Queen in May next, have cost 300*l.*

## NEW PREMISES, DUKE-STREET, GROSVENOR-SQUARE.

THE drawing of this was made from the buildings by Mr. Richards.

The whole of the southern portion of the block was erected for Mrs. Kerr, and contains in the basement, kitchens and assistants' dining-rooms, &c.; on the ground floor, shop and office; and on the upper floors sitting-rooms and workrooms, with dormitories and sitting-rooms for the assistants and servants.

The remainder of the block consists of shops on the ground floor and basement, with residential flats above.




With the exception of a low plinth in Portland stone, the whole of the building is erected in 1¾ in. red bricks, with fireproof flooring.

The builders were Messrs. George Trollope & Sons, and the architect Mr. W. D. Caröe.

The drawing was exhibited at the Royal Academy of last year.

## DESIGN FOR CHAPEL, BERKHAMSTED SCHOOL, HERTS.

THIS design was prepared for the Rev. T. C. Fry, D.D., the head master of Berkhamsted School, by Messrs. Batterbury & Huxley, architects. In order that the chapel might accord with the existing ancient school buildings, erected by Dean Incent, and opened in 1544, late Perpendicular was chosen.

The raising of the sacrarium and the choir was suggested by Dr. Fry, who wished to follow, to some extent, Pietro Lombardo's Santa Maria del Miracoli, Venice.

## WORDSWORTH BUILDINGS, LADY MARGARET HALL, OXFORD.

THIS building is the south wing of a range of new buildings, of which the centre block and north wing are not yet built. The north and south wings are intended for students; and the centre block will contain main entrance hall and staircase, dining hall with kitchen and offices under and library over, and will be carried higher than the wings.

The site is beyond Norham Gardens to the north-eas' corner of the Parks, and extends from the road down to the Cherwell. Owing to the shape of the site, the buildings have had to be designed on an irregular plan; and as the site lies below the roadway level, a causeway with a stone balustrade has had to be formed on the north side in order to get the drains into the town sewer.

The materials used are red brick, gauged brick, and Clipsham stone, tile roofs, and lead flats. A large skylight, inside the balustrade above the central part, lights the principal staircase. The south wing contains twenty-eight students' rooms, common room, lavatory, and bath rooms. An extension has been built on the north side, including temporary kitchen and offices and dining hall. This will ultimately form part of the central block.

The building has been erected from the designs and under the superintendence of Mr. Reginald Blomfield, architect, of London, at a total cost of 6,783*l.*, inclusive of electric lighting. The contractor for the works was Mr. J. A. Hunt, of Hoddesdon; electric lighting by Messrs. Hill & Co., of Oxford; carving by Mr. W. Aumonier.

## NOS. 2 & 3, SHIREOAK-ROAD, HEADINGLEY, LEEDS.

THESE houses were built in 1893 for Mr James Bedford. The main idea in planning them was to have two good rooms and a decent hall. All houses, of this size and rental, built in this district during the last eighty years, have aimed at three rooms, with the result that the rooms have been small, and the entrance reduced to the narrow passage with crowded stair so commonly seen. The halls in both cases have fireplaces, and are panelled up to the height of the doors. In No. 2 the panelling encloses the staircase, which has a door at the foot, so that one may smoke in the hall without fumigating the bedrooms. The houses are built of bricks, which were specially made thinner than usual in the locality, where they commonly measure 3¼ in. to 3½ in. in depth. The roofs are covered with thick green slates.

The architect was Mr. Francis W. Bedford, of Leeds. Messrs. Wm. Thompson & Sons did the brickwork, and Mr. Banks Mawson the joiner's work.

## THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

### NATIONAL GALLERY OF BRITISH ART.

ON the 30th ult. the first spring visit of the Architectural Association was paid to the National Gallery of British Art, and a party of more than fifty members inspected the building now nearing completion, under the guidance of Mr. Sidney R. J. Smith, the architect.

A full description of the building appeared in the *Builder* for January 2. Some items of considerable interest were the large blocks of stone, weighing several tons, used in the architrave of the main pediment, and entirely supported by being joggled without any use of iron or girders, and the figure of Britannia on the apex of the pediment weighing some ten tons.

The chief feature of the building is the central octagonal sculpture-hall, covered with a glass dome with iron ribs, each rib being bolted down with anchor plates to the stone piers. The picture-galleries are all top lighted, with only one thickness of glass, and the effect appears to be admirable.

The drawings showing the various suggestions for the external treatment were an interesting study of the various methods of treating the same subject.

ADDITIONS TO HYDRO, CLIFTON.—Additions are to be made to the Clifton hydro, from the designs of Messrs. Harper, of Birmingham. The floors will be fireproof, on the Fawcett system.

## *COMPETITIONS.*

BOARD SCHOOLS, SUTTON ST. EDMUNDS.—The following is the result of the competition for the new Board schools, for the Sutton St. Edmunds' School Board:—Accepted design, Mr. R. H. Holmes Hand, architect, Spalding; second, Mr. Gilbert S. Doughty, C.E., Pelham-street, Nottingham; third, Mr. Gerald McMichael, 21, Pershore-road, Edgbaston, Birmingham.

MOSELEY PRESBYTERIAN CHURCH. — At a meeting of the committee, the designs for a new church, lecture hall, &c., to cost 6,000*l.*, at the corner of Chantry-road, Moseley, were considered, and out of seven sets of designs submitted, those of Messrs. de Lacy Aherne and Arthur E. McKewan were placed first.—*Birmingham Post.*

ARTISANS' DWELLINGS, SUNDERLAND.—It is stated that Mr. Marten B. Perry, architect, of 17, St. Mary's-road, Walthamstow, in conjunction with Mr. Robert Angell, has been successful in obtaining the first premium in a competition for artisans' dwellings proposed to be erected by the Corporation of the Borough of Sunderland. The plans provide accommodation for 468 persons, at an estimated cost of 20,000*l.* There were in all fifty-eight sets of designs submitted.

## *ARCHITECTURAL SOCIETIES.*

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMAN'S SOCIETY.—At a recent meeting of this Society, a discussion took place on the paper on ventilation, read to the Society in December by Mr. Isaac Low. The meeting was presided over by Mr. J. Lockhead. The various systems in vogue were illustrated by means of a small model air-tight chamber, on which were fitted cowls of all descriptions for the demonstration of the natural systems, and by the use of a small fan the mechanical action of the system of extraction and propulsion was also very cleverly shown. Mr. Low, in referring to a recent letter by Mr. Keys, still adhered to his opinion that it is of great advantage to have school windows so constructed that they may be opened while the building is unoccupied, whatever system of ventilation is resorted to while the building is occupied. He held that there could be no gain in having a room shut up, almost air-tight, for say eighteen hours out of every twenty-four, and for over sixty hours at the end of every week, not to speak of holidays, and no one would think of keeping a fan running during these times, unless the power was running to waste otherwise. Mr. Keys' system, properly applied, provides an excellent means of keeping the rooms fresh during the short time they are occupied, but why allow them to stag-

nate during the longer time that they are unoccupied?

GLASGOW INSTITUTE OF ARCHITECTS.—The usual quarterly general meeting of this Institute was held in the rooms, 187, Pitt-street, on the 28th ult., Mr. John James Burnet, A.R.S.A., President, in the chair. The President referred to the fact that two of the members, Messrs. Honeyman and Leiper, formerly Associates of the Royal Scottish Academy, had now been elevated to full membership, and it was unanimously agreed that the hearty congratulations of the Institute should be sent to them. The Secretary reported that the prize drawings of the Royal Institute of British Architects would be on exhibition in the rooms of this Institute during the two weeks commencing 12th April next. It was agreed to hold an informal dinner in the rooms on March 3.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.—The sixth meeting of this Society was held on the 13th ult. at 56, Great Marlborough-street, Mr. W. Pywell in the chair. A paper was read by Mr. B. N. Southall on "Sham Construction and the Fixing of Facings," in which he traversed the most prevalent forms of false construction, and made many suggestions for improvements in the direction of truthful detail. In the discussion which followed, Mr. Brodie doubted whether exposed construction would be acceptable to the public; and Mr. Strange thought that the example of Nature, who never hides her construction, might safely be followed. Mr. Lander pointed out that although Nature may hide her construction, she does not deny it, as many buildings do theirs, and he thought a distinction should be made between concealment and a deliberate intention to deceive. Mr. Garbutt called attention to the dangers arising from the rust caused by condensation inside cased stanchions, and also to the inadvisability of casing steel joists solidly in concrete, as the expansion is liable to crack it. Mr. Herbert thought it difficult to know where to stop in one's criticism, as one might even abuse a plaster ceiling because it did not show the joists. He said he would like to see fireproof floors carried through to the outside face of the wall. He objected to cast iron which imitated wrought iron. Mr. W. C. Marshall, the Special Visitor, said he believed in all Mr. Ruskin said in his "Lamp of Truth," and could not understand why a lie represented in art did not bear the same moral culpability as a spoken lie. Some forms of deception, however, were generally accepted by all, such as gilding. He looked forward to the day when there should be a greater appreciation of iron forms, so that they need not always be concealed. He advised every one to cultivate truth in everything, however small. It came like writing fair—by practice. If every one would rise above the little falsities now so common, we might some day really "build in truth."

GLASGOW SCHOOL OF ART.—The first of a series of special lectures on "Hellenic Architecture" was delivered recently to the students of this school by Mr. William J. Anderson. Mr. Malcolm Stark occupied the chair, and introduced the lecturer, who had taken as his subject, "Th Mycenian Age in Greece." After a review of the formative influences of circumstances on the Greek character and genius, the lecturer said that to the book of the history of this race, which for our fathers opened with the Homeric Epics, there had been written a long preface and introduction. Researches in the Isle of Santorin, and Schliemann's work at Mycenæ and Tiryns, had recovered in broken outline the story of a bygone phase of human life, which had some affinity with early Celtic civilisation of Europe, and which was, in greater measure than had been formerly believed, the direct precursor of Hellenic culture in its greatest period. Viewed as architecture as a whole, two different forms of practice would be observed: one, a timber style, employing stone for foundations, combining wood with stone in walls, and sheathing it with metal; the other, a stone style, in which wood forms were directly imitated, and which still made use of metal plates in its decoration, both being closely related, and probably coterminous. Conjectural restorations of the palace of Tiryns, the domed tombs of Mycenæ, with Chipiez and Clarke's restorations of the portal and the cupola, were shown by lantern, with details of ornament, including the frieze of Tiryns, of alabaster, inlaid with glass paste, which is so valuable for the light it sheds on the origin of the Doric entablature. To these structures it did not appear possible to assign a later date than about 1200 B.C. Perrot, indeed, dates them at 1450 B.C. But this early civilisation — so advanced in many respects, and on the way to new inventions—was cut short and scattered by the Dorian migration, to begin its life over again, and in a fuller and larger way to work out its destiny. But the lecturer believed that the more this earliest period of Greek art was studied and explored the more we should discover what the arts of a later day owed to it, and how many of its principles and motives had survived. The dome construction, its decoration by metal plates, the use of the applied column and entablature, appeared again at Etruria and Rome, while the retreating faces of the architrave and inclined sides of the doorway, the fluted column, the triglyph frieze, the patera, rosette, palmette, and spiral—all were forms on which the later Hellene would exercise his genius. So that it was not too much to say that in Mycenian art we see the shoot appear above the ground, and that Hellenic architecture of the age of Pericles was essentially of the same root, the same plant in the same soil.

LIVERPOOL ARCHITECTURAL SOCIETY.—The fifth ordinary meeting of this Society for the present session was held on the 1st inst., in the Law Library, Union-court, under the chairmanship of Mr. Bradbury, the President. The paper read was by Mr. F. I. Thomas, and was entitled "Art Out of Doors," in illustration of which some sixty photographic views were shown by limelight. These had been selected so as to indicate the multiplicity of country seats throughout Great Britain in which architectural and horticultural art derive great attraction from their natural surroundings.

BRADFORD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of this Society was held recently at the Great Northern Victoria Hotel, Mr. James Ledingham, President, in the chair. Mr. W. B. Woodhead was elected President for the year, and Mr. Fairbank was re-elected Secretary and Treasurer. After the election of the Council the annual dinner was held.

NORTHERN ARCHITECTURAL ASSOCIATION.—A meeting of the members of the Northern Architectural Association was held on the 3rd inst., at the Art Gallery, Newcastle, Mr. F. W. Rich in the chair. The Chairman proposed the following resolution:—"The Northern Architectural Association, looking to the amount of public interest and criticism that has arisen respecting the proposed restoration of the western front of the Cathedral, Peterborough, desire to convey to the Dean and Chapter their appreciation of the course pursued by them in upholding and carrying out the advice of their architects, Mr. J. L. Pearson and Sir Arthur Blomfield, and however much the Northern Architectural Association may regret the circumstances that necessitate the pulling down part of the work, yet feel sure that in the hands of such an experienced and able man as Mr. Pearson there will be nothing done without cause." He said there had been a great deal of amateur criticism on this matter, and the more architects stood up against these innovations on the part of amateurs the better it would be for themselves. Mr. Reay seconded the motion, which was cordially agreed to. Mr. Frank Caws, of Sunderland, then read a paper on "The Probable Influence of the Technical Education Movement upon the Architect and his Work," in the course of which he said that architects should take deep interest in the technical education movement, because of the splendid opportunities it afforded for developing the talents of the young; and not from the merely selfish motive that it helped us to remain masters of the markets of the world; but because it tended to increase the happiness of men and women by increasing their knowledge and usefulness, and particularly by giving them a deeper insight and interest in their work, and so minimising the monotonous drudgery of their lives. Technical education could not long continue without thus raising the status and character of the worker, thereby inducing a general gain of intelligence, skill, and respectability in all trades and handicrafts. If the architectural profession would not remain hopelessly behind other crafts and professions; if architects would retain the proud position of masters of the technical arts—which the very name of architect implied—then they must bestir themselves and take advantage of the great opportunities the present moment afforded. How to do this Mr. Caws explained by showing how architects' pupils and students should devote the years of their apprenticeship so as to attain to the higher standard of qualification now called for. A hearty vote of thanks was accorded to Mr. Caws, after which the meeting terminated.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of the members of this Society was held at the School of Art, Arundel-street, Sheffield, on the 9th inst., when Mr. John Slater, B.A., gave a lecture on "The Buildings of the Ancients." Mr. C. Hadfield (President) occupied the chair. Mr. Slater, at the outset, quoted the late Mr. Fergusson's remark that beauty in architecture consisted not so much in particular features as in appropriateness of design and elegance of detail. In the present century there had been many changes of style. Each successive period had found ugly and unsuitable what had been praised as fit and beautiful by its predecessor, thus showing the narrow-mindedness of those who posed as the directors of the public in matters of taste. It might not be uninteresting to go back to a time anterior to all the recognised styles, and see what kind of buildings were erected by the ancients, when the sole object was to meet the requirements of the people for whom the building was intended, and who obtained architectural effect by ornamenting their construction, and not by constructing their ornament. The first builders who attained to any great architectural skill were the Egyptians, in whose history four periods stood out as those of great architectural activity. These periods were the fourth dynasty, when the great Pyramids were erected; the twelfth dynasty, to which belonged the tombs at Beni Hassan; the period when Thebes was at the zenith of her power; and the period of the Ptolemies. Details were given of the construction of the Pyramids, showing that the most scientific precautions were taken to prevent the heavy superincumbent mass from crushing in the sepulchral chambers. In the tombs of Beni Hassan, it was noticeable how often wooden forms were reproduced in stone. In these tombs were to be found the prototype of the Doric column, as well as of the plan of the perfected Greek temple. The enormous temple of Karnak, with its hypostyle hall, was described, and so were the different forms of capitals found there. The great feature of the Egyptian temples was their solidity and massiveness, but relieved by the most elaborate and varied system of colouring, the granite columns having been coated with stucco before the application of the colour decoration. Crossing from Africa to Asia, different materials and methods of building were found, sundried and burnt bricks forming, in the absence of stone, the staple building materials. In consequence of the friable nature of these materials there existed for many centuries nothing but heaps of rubbish to mark the sites of some of the most notable buildings of antiquity. Quite recently, the most valuable and interesting discoveries had rewarded the exertions of explorers. No less than seven palaces of the Ninivite kings, whose dynasty lasted from B.C. 1250 to B.C. 625, had been exhumed, the most complete and interesting being that of King Sargon at Khorsabad, which was thoroughly explored by Messrs. Botta and Place. Here were discovered the most magnificent arched gateways of brick, arched covers to sewers and conduits, and enamelled encaustic tiles of different colours and patterns, which were as fresh and vivid as if they had only recently been taken from the kilns. The exact manner in which these large buildings were lighted was largely a matter of conjecture. The third great building people of antiquity were the Persians, whose supremacy in Central Asia dated from about the sixth century B.C. The rocky plateau of Persepolis was the site of the most magnificent palaces of the kings, and the ruins still existed to testify to their grandeur. In the recently-explored Hall of the Hundred Columns, the columns were of marble, the capitals being the well-known double bull's head, between which rested the beams supporting the roof. The height of the columns, 67 ft. 4 in., was more than double the height of the columns of the Parthenon. The bases of the Persepolitan columns were particularly graceful, and it was rather curious that this form had never been adopted by the Greeks. The curious and interesting domed building at Feruz-abud and Sarvistan, the dates of which it was difficult to determine, were almost certainly the precursors of the Mohammedan mosques. From the wall decorations discovered by M. Dieulafoy, it was certain that the Persians, like the Assyrians, had arrived at a high pitch of excellence in the manufacture of glazed enamelled tiles. After alluding to recent discoveries in the district anciently called Phrygia, and to some curious examples of the exact imitation of wooden forms in stone, the lecturer concluded by saying: As the byways of the world become opened up to us, we are continually finding unexpected remains of building nations, and it is not too much to say that wherever over the whole face of the earth explorers have come upon the relics in stone

or brick of a remote civilisation, their wonder has been excited at the solidity, and in many cases the high artistic quality of the work. It appears to me that, despite all our modern resources and all the discoveries of science in these latter days, no one can study such buildings as I have brought to your notice this evening without having a little of his nineteenth-century conceit taken out of him; for truly all the remains testify that in energy and in intelligence, and in skill, there must have been giants in those days. The paper was illustrated by a number of large diagrams prepared by Mr. Slater. A vote of thanks was accorded to the lecturer, on the motion of Mr. E. Winder, seconded by Mr. Joseph Smith, and supported by Messrs. J. B. Mitchell-Withers, F. Fowler, T. Winder, E. M. Gibbs, C. Hadfield, and C. J. Innocent, and Mr. Slater briefly replied.

## *ENGINEERING SOCIETIES.*

INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution on the 9th inst., Mr. John Wolfe Barry, C.B., F.R.S., the President, in the chair, the paper read was on "Cold Storage at the London and India Docks," by Mr. H. F. Donaldson, M.Inst.C.E. The author traced, from the commencement of the experimental stage in 1881, the progress in the accommodation of the frozen-meat trade in the Port of London. The work had been carried on—first by the London and St. Katharine and the East and West India Docks Companies, and subsequently by the London and India Docks Joint Committee, which came into existence in 1889—in the construction of receiving-chambers at the Royal Victoria Dock, and, later, at the South West-India Dock. The first experimental chambers at the Royal Victoria Dock had been constructed in 1881, but they were discarded, and improved buildings, insulation and machinery had been adopted in 1887. These buildings consisted of two floors, each about 10 ft. high, arranged with chambers on each side of the engine-room, which was placed in the middle. One end of the buildings abutted on the quay on which the meat was discharged from vessels. They were further supplied on each side with platforms generally used for receiving meat from the quay, and for the discharge into railway wagons of meat for despatch to the various centres of consumption. The end remote from the water-side was provided with a platform for the delivery of meat into carts for transport into the meat market, or for delivery by road. The side platforms were also supplied with small lifts by which the upper chambers were charged, curved rails being fitted at the top to automatically discharge the load when the ram of the lift arrived at the end of its stroke. The flooring of the ground floor was a few inches only above the normal level of the ground or rail-level. Entrance to the chambers was obtained through small doors opening into lobbies at the level of the ground floor, from which ordinary insulated doors opened into the chambers, and by these means the rise of temperature through the opening of the doors to the outer air was reduced to a minimum; the coldest air remaining in the trough or tray, between the sill-level of the entrance door and the ground-level. The lobbies were so arranged that two chambers could be entered from one outer door. The meat was received and delivered through portholes, about 4 ft. 6 in. above the ground-level and 1 ft. 6 in. above platform-level, made of two sizes, one inside the other, the larger orifices being used for quarters of beef, and the smaller for frozen sheep. An account was also given of the construction of stores at the North Quay, West India Dock, and at the cold store, which had been built and equipped at West Smithfield. The total storage capacity now in use by the London and India Docks Joint Committee was, at the Royal Victoria Dock, 926,604 cubic feet; at the South West-India Dock, 50,000 cubic feet; at the North Quay, West India Dock, 378,613 cubic feet; and at West Smithfield, 365,717 cubic feet.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the last meeting of this Institution, held at the Westminster Palace Hotel, the Chairman, Mr. H. Bloomfield Vorley, presiding, an interesting lecture on "Comparisons of Similar Structures, Large and Small," was given by Professor Archibald Barr, D.Sc. of Glasgow. The lecturer first enunciated the general principles regarding the loads which similar structures can bear with like severity of stress, and showed their application to pistons, cylinders, boilers, beams, bridges, roofs, columns, shafts, &c. He then dealt with comparisons of similar structures with respect to rigidity, illustrating them by reference to shafts, beams, bridges, test-specimens, &c. Similar structures with regard to suitability for bearing their own weights, were then treated, and applications to tanks, ships, &c., shown. The influence of size upon the design and proportions of structures was considered, and illustrations given taken from nature. Comparisons of similar objects with respect to their suspension in water and in air, formed the next section of the lecture, and in this connexion the flying-machine problem was investigated. Similar machines, with reference to inertia stresses, were then compared. At the conclusion of the lecture, on the proposal of Mr. S. Boulding, seconded by Mr. E. King, a cordial vote of thanks was passed to Professor Barr.

## THE DWELLING HOUSE.

ON Thursday evening last week, at the London Institution, Dr. G. Vivian Poore delivered a lecture on "The Dwelling House," illustrated by lantern slides.

The lecturer stated at the outset that he intended to deal with his subject from the physician's point of view, and not from the architect's. The first plans exhibited showed a five-storied London house, before and after it had been altered in accordance with modern notions of plumbing. Generally speaking, there were necessary or unavoidable defects about most London houses, owing to the limited area of the land upon which they were built, but in the country those defects could be generally avoided. In the London house the cubic contents of the house bore an undue proportion to the land upon which it stood. Speaking of the staircase of the London house, the lecturer said that one of its defects was that unless the staircase was efficiently ventilated it served as a channel for the conveyance of the air from one part to another, which sometimes was not at all desirable. There was nothing more important in a dwelling house than the perfect ventilation of the channels of internal communication. If those channels were properly ventilated fresh air could be got for the rooms in the house; but if they were not they then served for the drifting of foul air from one room to another. Another difficulty in regard to the London house was as to the supply of light and air laterally. The lecturer also referred to other defects in the London house, such as dark underground basements, absence of back doors for delivery of goods or removal of refuse, ill-ventilated staircases and close "areas" shutting in the gullies leading to the sewer, insisting that, although such defects might he inevitable in London, they should never be imitated in the country. Great height not only increased the risk from fire but increased the labour of service, because moving vertically involved twenty times the labour of moving horizontally. The risks from infectious diseases were greatly increased by these high houses which were getting daily more common. Modern methods of sanitation gave a fatal facility for over-crowding, which was certain eventually, if not checked, to do more harm than the sanitation had done good. In country places where it was possible to give adequate area to a house, it was most important to ensure the thorough ventilation of the staircase and passages. In dwelling-houses, as in hospitals, all sanitary offices should be shut off by a ventilated lobby from the main structure, and the lecturer showed plans by which the staircase might be made to fulfil this purpose. The question of aspect, the advantages and disadvantages of a cellar beneath a house and the great importance of a wholesome larder were points which received attention. The lecturer next considered plans by which the sanitation of an isolated house might be made independent of the Local Authorities, and he showed plans of "filtration gutters" by which domestic slop-water might be easily purified. Overcrowding was the greatest of all sanitary ills, and was often fostered by sewage schemes. A plan was shown of an estate of nine acres lying between two newly sewered suburban roads, which had, as was usual in such cases, been bought by a so-called building society—and in which 177 houses, with a population of over 1,200 was contemplated! These societies were a cause of sanitary ruin, æsthetic ruin and financial ruin; they encouraged artisans to begin life with a mortgage round their necks, and occasionally landed them in the clutches of a professional usurer. Some of the model by-laws of the Local Government Board were not suited for country places, and regulations as to air space round dwellings, which might be beneficial in towns, became mischievous suggestions when printed and circulated in the country. Again, the London Building Act placed no adequate check upon enormous structures, and "open spaces" (bought at great cost) were definitely made an excuse for the abolition of private curtilage to houses. These large buildings were common in the centre of London, and it was curious to note that the "Strand Registration District," which was the pulpit from which we had preached sanitation to the whole world, and which was exceptionally well provided with open spaces was, next to the City of Liverpool, the most unhealthy registration district in the country. So-called "lungs," in which the blood only circulated occasionally on a Sunday, were no compensation for a lack of space and light and air in the dwelling. The cost of the dwelling-house was steadily increasing. Taking a concrete example in Marylebone—it was shown how the rates had risen 87 per cent. in twenty-three years, and how the whole of the obligatory charges—rent, rates, taxes, and water—amounted to over 2*l.* per annum per square yard of occupied land. Would this upward tendency of the rates ever cease? Increase of cost of the dwelling inevitably led to over-crowding, and every addition to the rates increased the cost of the dwelling. Looking at the physical and moral harm which resulted from over-crowding, every increased tax on the house ought to be very seriously considered. Schemes of ostentation and so-called philanthropy which fell heavily on the householder in the form of rates, did harm rather than good. Some outlet ought to be left for private generosity. Very little was done to check overcrowding. On the contrary, the jerry-builder was fostered at the expense of the ratepayers. Modern sanitation was largely based on a mischievous, lop-sided socialism, which was doing incredible harm. No improvement could take place unless it were found possible to encourage the sanitary well-doer. If the man who built a wholesome isolated house and completed his sanitation on his own premises was merely "rated up" and practically fined for doing so, no improvement was possible. The lecture concluded with sundry suggestions for the equitable adjustment of sanitary rates.

## THE CLERKS OF WORKS' ASSOCIATION:

### ANNUAL DINNER.

THE fourteenth annual dinner of this Association was held on Monday, in the King's Hall, Holborn Restaurant, Mr. Beresford Pite, President of the Architectural Association, occupying the chair, supported by Professor Roger Smith and Messrs. W. Pite, H. B. Cresswell, H. D. Searles-Wood, W. H. Seth-Smith, J. E. Drower, T. B. Whinney, Stanton W. Preston, J. Shepherd, Stanley Clarke, Bousfield, and others.

The usual loyal and patriotic toasts were proposed from the chair, the "Army, Navy, and Reserve Forces" being responded to by Col.-Sergt. J. Aitchison. The Chairman, in speaking of the Navy, said that whatever other nations might think of our domestic, ecclesiastic, or monumental architecture, they had a profound admiration for our beautiful naval architecture.

Mr. J. Brady, editor of the *Clerks of Works' Journal*, in proposing the toast of "The Architects and Surveyors," said that architects of late years had been doing a great deal for their Association by coming to them when in need of clerks of works, and to both architects and surveyors that Association felt much indebted. The toast was coupled with the names of Professor T. Roger Smith and Mr. J. E. Drower.

Professor Roger Smith, in replying for the architects, said he had often thought of the large amount of thought and labour which was represented in connexion with every building. They had granite from one quarter of the world, stone from another, and iron from another; but beyond that each building represented a large amount of thought, and he sometimes wondered, after the building was completed, where all the thought and labour had gone. In the carrying out of their work architects were helped to a large extent by clerks of works. The question of the cost of a building having been thought out before the clerk of works came upon the ground, those gentlemen should do all they could to help keep reasonably within the limits which the employers set as to cost. Clerks of works might also render great service to architects and the undertaking in looking ahead. The clerk of works should keep his architect well posted up,

not merely in the work of the moment, but in prospective work.

Mr. Drower, in a humorous speech, responded for the surveyors, and in doing so referred to the Architectural Association—a body in many respects one of the most extraordinary in the kingdom, and which was doing a vast educational work for architects, which in nearly every other country would be carried on by the State. In his opinion the Clerks of Works' Association could to some extent be compared with that Association, since it was a self-helping body, and self-relying, and their main principle was education and the laudable desire of keeping up the status of their vocation.

Mr. F. Dashwood, secretary, then proposed the toast of "The Worshipful Company of Carpenters." To the Carpenters' Company a debt of gratitude was owing by the trade for its important help in matters of education. At one time he thought that nothing could compensate for the old-time system of apprenticeship, but having for some time seen the character of the work carried out by the young men who attended the schools of the Company, he had no hesitation in saying that in some cases the character of their work was even better.

Mr. Stanton W. Preston, Clerk to the Company, in response, said that there were twelve so-called great Companies, the rest being minor Companies, and the Carpenters' Company was one of the latter. He thought that he had some reason to be proud of the work which his Company was doing, and he believed that this work took the place, as far as anything could, of apprenticeship. Besides their workshops at Great Titchfield-street, there was the Institute at Stratford. In reply to the last speaker, he would say that the Company had no intention of admitting amateurs into their classes—for one reason, because they had no room.

The toast of the evening, "The Clerks of Works' Association," was then proposed by the Chairman, who referred to his early acquaintance with clerks of works, and with their Association. He had watched with considerable interest the growth of their Association. The sentiment which drew men of the same avocation together was a very worthy one, which nearly always resulted in good to the community. No one that evening had any doubt that the idea of clerks of works associating in a body, in which they could combine for their own mutual benefit and for the cultivation of a higher standard of efficiency, was one which had been justified by the results. He therefore desired to cordially invite any clerks of works who had not yet united themselves to that Association to consider the very great advantage that would accrue to them by joining men who had set before them a high standard. He was very much struck by one note in the constitution of their Association, viz., to "neutralise as far as possible the disadvantage of enforced isolation under which many clerks of works labour." He had never before realised the truth of those words. A clerk of the works occupied an exceedingly isolated position. This fact was a complete justification for the existence of that Association. A clerk of works had to think and decide for himself, and had to be a man of rapid thought, but at the same time his position was an enjoyable one, since he was not troubled by the responsibilities either of the architect or of the contractor. He believed that the Association consisted of men strong in mind and strong in hand, and men who were trustworthy, and who were not only self-reliant, but upon whom others could rely—they were men of experience and common-sense which could not be achieved by university training, and could scarcely be tested by examination. That common-sense was of great value to architects as well as to the community. Clerks of works were an ideal embodiment of the handy practical man.

Mr. W. S. Woolacott, President of the Association, in reply, referred to the comparatively small membership of the Association, which was a subject of regret. If a clerk of works possessed anything like the qualities which the Chairman had bestowed upon him, he should most certainly be better paid. The London County Council had recently raised the wages of their clerks of works by half a guinea per week, and he thought that a further increase might very well be made.

Mr. E. W. Nightingale proposed the toast of the visitors. They had twenty architects as guests that evening, besides others. He was glad that the architects were taking more interest in their Association than they ever did before.

The toast was responded to by Mr. T. B. Whinney.

Other toasts were "The Press," proposed by Mr. J. E. Peacock, and coupled with the name of our representative, who responded; "The Hon. Treasurer" (Mr. J. Oldrid Scott), proposed by Mr. P. J. King (Vice-President), and responded to by Mr. J. Spooner; and "The Chairman," proposed by Mr. J. Plowman.

The proceedings then terminated.

## SANITARY INSPECTORS' ASSOCIATION.

A MEETING of this Association was held at Carpenters' Hall, on Saturday last, when the newly-elected President, Sir John Hutton, filled the vacant chair of the late Sir B. W. Richardson, and a paper was read by Mr. Billing, on the subject of "Meat Inspection." In the discussion which followed on the usual resolution of thanks, Messrs. West, Young, Alexander, Thomas, Montem (Portsmouth), Grigg, Tidman, Raymond, Munro, and Sir John Hutton took part. A suggestion was made that the Technical Board of the London County Council should help Sanitary Inspectors, whose duty it had now become to inspect meat offered for sale to the public, to educate themselves in this difficult branch of their duty. The President agreed with one of the speakers who pointed out that a Sanitary Inspector should scarcely be expected to have the experience necessary for the new duty put upon him, or to be able to spare the time from his multifarious duties to acquire that experience.

A vote of thanks to the lecturer was agreed to, and Mr. Billing briefly replied.

## THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Sir Arthur Arnold, Chairman, presiding.

*Tower Bridge Southern Approach.* — On the recommendation of the Improvements Committee, it was agreed that, in connexion with the formation of the new southern approach to the Tower Bridge, the Council do take such steps as may be necessary to acquire from Mr. Lafone, at the sum of 14,500*l.*, the vacant land (having an area, including the approach road, of about 48,170 square feet) situated near the line of the proposed street, and at present having approaches from Tanner-street and Newham's-row.

*Housing of Lunatics*—The Asylums Committee stated that their Sub-Committee, appointed to report as to the expediency of adopting a better and less expensive method of housing and treating pauper lunatics, and to consider the systems adopted in the principal European and American cities, had come to the conclusion that it was impossible to proceed further in forming any definite or practical opinion as to the merits of the modern continental system of the housing and treatment of lunatics without personal inspection of some of the asylums where special methods other than those obtaining in this country were in vogue, and that for this purpose it would be desirable for three members of the Sub-Committee, with two expert medical officers, to visit the various asylums at Paris, Berlin, Leipsic, and other continental cities. The Council were asked to authorise the expenditure of 150*l.* for travelling and out-of-pocket expenses. After some discussion, an amendment to refer the whole matter to the General Purposes Committee for consideration and report was agreed to.

*Proceedings with Regard to Dangerous Structures.*—The Building Act Committee reported as follows, the recommendation being agreed to:—

"We reported on January 26 last that the High Court had on December 10 reversed a decision of the magistrate at the Thames Police-court dismissing a summons for recovery of expenses incurred in respect of a dangerous structure, as he held the opinion that it was necessary, under Section 103 (1) of the London Building Act, for the Council itself to consider each intimation that a structure was dangerous, and to authorise service of notice upon the owner and other proceedings if necessary, and that the case had been referred back to the magistrate to be heard on the facts. The case was again before the magistrate on January 13 and 27, when he raised another point, namely, that by reason of Section 109 the Council could not recover any expenses unless it had obtained an order under Section 107 (1). The point was argued at some length, but the magistrate eventually dismissed the summons on the ground that the Council could not recover expenses when, as in this case, the owner did the work upon receipt of a notice, and consequently no order was obtainable. This point was not included in the special case stated by the magistrate for the decision of the High Court. as it was understood that, although the question was raised, the magistrate took the Council's view upon it. This not being so, as shown by his recent decision, we think it essential that the matter, which affects a very large number of cases in the course of each year, should be submitted to the High Court. We have accordingly directed the Solicitor to get a case stated, and we recommend—'That the Solicitor be instructed to take the necessary measures for obtaining a decision of the High Court upon the point above referred to.'"

*Highgate Archway.*—Major Probyn, Chairman of the Improvements Committee, stated, in answer to a question by Mr. Westacott, that the Council would shortly be in a position to proceed with the reconstruction of Highgate Archway.

*Water (Purchase) Bills.*—The Parliamentary Committee submitted for approval the agreements on the Water Question with Surrey, Croydon, Kent, Essex, and West Ham.

Mr. M'Kinnon Wood first moved:—"(*a*) That the agreement with the County Council of Surrey be approved and sealed, and that, subject to the approval of Parliament, such clauses as may be necessary to give effect thereto be inserted in the Bills relating to the Lambeth and Southwark and Vauxhall Water Companies, and that the clause arranged with the Corporation of Croydon be approved, and, subject to the approval of Parliament, be inserted in the Bill relating to the Lambeth Company." He pointed out the serious consequences to the whole question of the purchase of the Water Companies if the just claims of the outside authorities were not fairly dealt with. He did not see how the Council's Bills could be expected to pass the House of Commons if opposed by the Companies and the Home Counties.

Sir John Lubbock, M.P., moved, as an amendment, "That it is undesirable to break up the water area until after the fullest inquiry; and, further, that in the opinion of the Council it is not just to the ratepayers of London that the outside authorities should have the option of determining whether they will join in the purchase of the undertakings of the Water Companies, after the price has been fixed; and that it would be equitable that they should be bound by the results of the arbitration, in the same manner as the County of London."

The Earl of Onslow, in seconding the amendment, said the agreements grossly neglected the interests of London. Parliament would now see in all its nakedness the Progressive scheme of spoliation, as by it London was to bear the cost of purchase, and then hand over the most remunerative parts of the area to other bodies.

Mr. M'Kinnon Wood, in reply, said that the agreements simply provided that the outside authorities should go on as customers of the Council, or buy out at a fair price the right to supply their own areas.

On a division the amendment was rejected by 57 votes to 47, and the recommendation of the Committee was agreed to.

The next proposal, to arrange an agreement with the Kent authorities, was taken back.

The Council then, on a division, agreed by 55 votes to 44:—"(*c*) That the Council accept the memorandum set out in Appendix B, substituting for the 6th clause a provision to the effect that the necessary clauses be adjusted between the Councils of the Counties of Essex and London and the County Borough of West Ham." By this vote the London County Council agree to purchase the East London Water Company; an Essex authority to have the option of taking over an apportioned part of the East London undertaking; and the County Borough of West Ham to elect whether it will join London or Essex or have an independent portion of the undertaking transferred to it.

It was further resolved that petitions be presented against the East London Water Bill, the Kent Water Board Bill, and the New River Company's Bill.

*Proposed Incorporation of Westminster.*—Mr. Costelloe brought forward a report of the Local Government and Taxation Committee dealing with a petition which has been presented to her Majesty in Council, praying for a charter of incorporation of the City of Westminster. The committee recommended the Council to pass the following resolutions:—

"(*a*) That while the Council does not object to a charter being granted for the incorporation of any suitable area in London, for the purposes merely of the change of the corporate name and the substitution of the name of the mayor and council for the existing name of a vestry or district board, provided that this can legally be done in the manner proposed,

the Council will strenuously oppose any transfer of powers by any such machinery, or any such transfer by any other machinery to a particular area, without the simultaneous consideration of the whole subject of powers and areas in London.

(*b*) That a communication in accordance with the above resolution be sent to the Privy Council."

There being a prospect of a long debate on the report, Mr. Costelloe consented to postpone its further consideration for a week. There was, however, much opposition to any adjournment, and a considerable body of Progressives demanded a division, with the result that the adjournment was carried by 44 to 43.

The Council then adjourned.

## THE LONDON COUNTY COUNCIL INQUIRY.

THE special inquiry into the organisation of the Works Department of the London County Council was continued at Spring-gardens on the 27th ult. Sir Arthur Arnold presided.

The examination of Mr. Ward, the Chairman of the Works Committee, was continued by Sir Godfrey Lushington and completed. The witness said with regard to work executed before the institution of the Works Department that the work done under the direction of the Engineer, Mr. Binnie, was of the highest character; but he could not say the same of the architectural work. He instanced Bishopsgate-street Fire Station as a case in which a great deal of money had had to be spent on sanitary work within a few years of its erection. One of the advantages of the Works Department was that it secured low tenders from contractors, because contractors knew if they sent in excessive tenders they would not be accepted, but the work would be done by the Department. Pressed to mention other Corporations which executed building work by direct employment, Mr. Ward stated that the Great Eastern Railway Company were building many stations, and that the London and North-Western Railway were following in the same direction. Liverpool, Birmingham, and Glasgow had all executed or were carrying on large operations in the construction of waterworks. He did not admit that the Works Committee had been instituted for the protection of workmen.

In reply to Sir G. Lushington, Mr. Ward said the Committee might be regarded as a builder. It was true that it did less work than a contractor, and that its manager did rather less than a contractor's manager would do. The Committee did not claim to have any authority over the Architect or the Engineer, and it had no right to call upon either to attend the Committee.

The examination of the Chairman of the Committee was completed by Dr. Longstaff, who elicited the opinion that certain great evils in the system were largely due to open tendering, and that tendering from a selected list of builders would be very much better. He did not think that such a method of tendering would do away with the necessity of the Department, because the tenders of contractors would, in that case, at once jump up. The witness reiterated his opinion that the work of the Engineer had always had a high reputation, and his complaints against the building and sanitary work at the Bishopsgate-street Fire Station, which although only erected in 1884, had already cost from 500*l.* to 1,000*l.* to remedy the defects. There had no doubt been a great advance in sanitary matters in the meantime, but no one could justify such work as had been done there. The joints had not been properly made and the result was a constant escape of sewer gas. Matters had now been improved, but bad work was still done, although he admitted that the inferior work was usually done by jobbing contractors and not by the original builders.

At the close of the examination, Dr. Longstaff asked: Are you not helping the strikers and taking a side against the employers when you agree to await the result of a strike and to pay the new rate of wages?—I don't think so.

Is it not substantially an agreement in favour of the workmen? Don't you think this will have a tendency to make the men, while continuing in the employment of the Department, ready to support a strike going on in another place?—It may have that effect.

Mr. Edward White, the next witness, said, in reply to Sir Arthur Arnold, that he had been Vice-Chairman of the Works Committee for a year, and had had considerable experience as a builder. In answer to the question whether there was any difference in the work of the Department and that of contractors, the witness said a fair comparison might be instituted between Banstead Asylum, executed by an outside contractor, and the temporary buildings at Colney Hatch, executed by the Department, which were similar in design and construction. The work carried out by the contractor was very satisfactory, that of the Department was of a very inferior character. The cost, too, of Colney Hatch he set down at 23,482*l.*, or about 6,000*l.* above the estimate. Questioned with regard to the refusal of contractors to tender, Mr. White said he did not think there existed any ring in the ordinary sense of the word, but he thought there was an agreement amongst the best firms not to submit to certain vexatious conditions, such as the examination of their books, which was among the conditions exacted. He thought no contractor would object to the examination of his time-sheets, which must be the very best evidence they could have, and that the examination of books was not necessary. Money was not saved by the Department through these conditions, but the effect was all the other way. With regard to the cost of management (20,000*l.* for the past year), he thought it very excessive, and that the capital employed was out of all proportion to the work done. He thought it would be an improvement to reduce the number of the members of the Works Committee, but in his opinion it would be better to abolish it. He would give a competent manager full power over the works, subject only to a financial committee. He should have a proper buyer, but should not be controlled by the Council. A competent manager might with advantage tender with contractors, because, like the builder, he would consider values only, and not be guided by tenders, however low. He knew of no other public body that undertook building works, though there were many that undertook engineering, or what he would call municipal works. By municipal works Mr. White afterwards explained he meant the construction of streets, roads, sewers, main drains, and other works of the same character, which would be designed by the engineer. Such works could be better or as well done by the Department as by a contractor, but jobbing works should be done by contractors. The system of the School Board was very satisfactory, the metropolis being divided into twenty districts, and clerks of works being appointed for each. He considered a monthly return of the cost of works in progress an absolute necessity. If they had had such a return in an undertaking where they had dropped 2,000*l.*, they must have found it out. No monthly return was ever presented to the Committee when he became vice-chairman. He had brought the question forward on more than one occasion, but was always "pooh-poohed," the proposal being described as worse than useless—misleading. At the last meeting such a return was presented, and he (the witness) asked certain questions upon it, the answers showing that, until completion, the Committee had no idea whether jobs were costing too much or too little. From a builder's point of view such returns were extremely important. Asked with regard to the stock of timber, the witness thought the stock was not too large; but many of the purchases had been badly made, and there had been a good deal of waste in consequence. In regard to the question of interference by members of the Committee, he said he himself had never interfered, but there had been an advantageous intervention in the case of works at Shoreditch, on account of a threatened strike of unionist workmen against the employment of non-union men. He advised that a notice that no difference would be made between the two classes of men should be put up, and since then there had never been any difficulty.

In reply to Sir G. Lushington, Mr. White drew a strong contrast between the methods of the Committee and the methods that would be adopted by the ordinary builder. A builder would never listen to a complaint from a discharged workman. He would insist upon periodical returns. If a builder found out that a job was going wrong and he could not find any special cause for it, he would think the foreman was not doing his duty and would demand an explanation at once, but this could not be done without regular periodical returns. He had found, eventually, that the rules did contain a clause requiring such returns, but a copy was never sent to him or other members of the Committee, and the rule was never acted upon. They had been carrying on important works for two and a half years without these necessary reports being demanded during the progress of any works. This seemed to him like the work of amateurs. He was afraid that when workmen were employed by a public body they did not see the importance of doing as much work as when employed by contractors. He had read the very flourishing report given in evidence by Mr. Jacobs, and he compared the cost of the works, of which that witness had been foreman, with the estimates, finding in each case a loss where the works were completed, and what must necessarily prove to be a loss in works not yet completed. If he had found such a state of things on a job in which he, as a builder, was interested, he should have tried another foreman.

The further examination of the witness was adjourned until Friday, January 29, when, before the examination of Mr. White was resumed, a document was put in by the Clerk to the Council, giving the replies of the Corporations of Manchester, Liverpool, Birmingham, and Glasgow to questions which the Clerk had been instructed to make as to the systems adopted by them in carrying out works. Similar questions were also anwered by the engineers of the Great Eastern, London and North-Western, and seven other leading English railways. In the case of both classes of corporations structural works appear, as a rule, to be given out to contract, the principle of direct employment being applied, generally speaking, only to the work of maintenance. The main drainage works of Manchester are executed by contractors; while in Liverpool all work of an extensive character is done by contract under the supervision of the Surveyor, and in Glasgow a similar practice is in force. Birmingham carries furthest the principle of direct employment. The following reply from the London and South-Western Railway Company may be taken as the type of the answers from all the railway companies: "The general practice of the company is to execute all works by contracts, taking care to employ only firms of experience and ability."

The examination of Mr. E. White was resumed by Dr. Longstaff, who elicited details with regard to the opposition of the witness and some other members of the Committee to certain jobs being undertaken. He advised that the Committee having lost its manager and being in a disorganised state, a proposed orphan asylum should not be undertaken, because, under the circumstances, it was sure to result in a loss. Attention had been frequently called to defective woodwork at Westview cottages. On examination he found the doors coming away from their hinges through the absence of the blockings which were necessary to enable the 2 in. screws used in the jamb linings (rebated 1¼ in.) to bite effectively. Only the plain part of the screws was in the wood. When asked why he had neglected to put in proper blockings, the manager answered that no blockings were shown in the drawings. The witness said he had never seen such work. Blockings were never shown in drawings. It was the business of all artisans to know when they were required to be used. With regard to defective plumbers' work, the witness said he had seen "the museum." He called attention to the D-traps which, though now disused, were considered proper ten years ago. They were very good, but they had, of course, not the nice finish of new work. With regard to soil-pipes, it would have been considered sufficient a few years ago to put the end of one pipe into the head of another and finish off the joints with red lead. It was not bad work for the time, though it might seem so now when there had been a great advance in sanitary work. He was much opposed to open tendering. Some firms would not tender for jobs in competitions thrown open to all, because it encouraged a kind of dishonesty in the less scrupulous contractor. It had been stated by Mr. Burns that a ring had been formed to prevent contractors from tendering, but he had no knowledge of such a ring. Builders of the better class refused to tender under the conditions imposed, and the Committee was compelled either to go to builders of a lower type or to do the work themselves.

In reply to Mr. Beachcroft the witness justified the use of the phrase "boss of the Committee" he had applied to Mr. Burns. He had refused to take the position of chairman of the Committee when it was offered, because he was dissatisfied with the way in which they were carrying out the works. He felt that great disasters were ahead, and he considered it better to be in opposition. As vice-chairman he was never consulted by the chairman, and had no more share in the business of the Committee than an ordinary member. There was a general antagonism between the two parties on the Committee, the circumstances of one of the numerous disagreements being detailed by the witness. He had repeatedly, he added, asked the Council not to undertake more work because it had its hands already full. In another dispute which led to the decision to make no

difference between union and non-union labour his opponents had predicted a revolution — a general turn out of the workmen—but the only revolution had been a peaceful one, for they had never had any trouble since.

In reply to further questions, Mr. White gave explanations in great detail regarding his investigations of monstrous overcharges in the cases of Manchester-square and Westminster Fire Brigade stations. He had made a calculation which showed that on jobs completed last year, but not yet reported, there would be a loss of 20,000*l.* Exact figures were given with regard to each work in order of date, and the grounds of the assumption as to the amount of the loss were fully stated. Mr. Beachcroft: Are you satisfied that nothing further will be discovered in the nature of "bogus entries?"—Well, I have received a letter from a former employee of the Department who holds a different opinion, and who offers to give evidence. —The letter, signed W. B. Fullwood, now Engineer to the City of London Lunatic Asylum, was read. The writer offered to point out where the first false entries were to be found and indicated the existence of a duplicate set of books. Only one set had been seen by the Comptroller.

In reply to Dr. Collins, the witness described the Works Committee as "the most imperfect piece of machinery that could be devised for carrying on a large business." The examination of Mr. White was not concluded when the Committee adjourned to Wednesday, February 3.*

## Correspondence.

*To the Editor of* THE BUILDER.

### LONDON WATER SUPPLY.

SIR,—As a matter of public interest we have thought it our duty to call attention to the present action of some of the London Water Companies in serving notices on owners of houses to take out their three gallons flushing cisterns, and to substitute two gallons cisterns.

Although the Water Companies' Regulations only permit a two gallons flush, the Regulation has not been hitherto strictly enforced, at any rate, not in the better class of houses.

As experienced sanitarians, we have been in the habit of recommending three gallons flushing cisterns, being satisfied that a two gallons flush is not sufficient to clear the closet trap and drain however perfect their construction, and it is also well known to us that most of the so-called two gallons flushing cisterns do not discharge more than a gallon and a half.

We consider that such a retrograde movement should not be allowed to pass unchallenged, as it is a serious menace to the health of the metropolis, and we, therefore, take this means of making known our views on this important point.

There are other matters in which sanitary engineers are at variance with the Water Companies, especially in the district served by the New River Company, such as the provision of automatic flushers for urinals and drains in clubs, banks, &c., where their use is, from a sanitary point of view, of paramount importance.

It is, therefore, quite time that the public should be impressed with the absolute necessity of placing the water supply of the metropolis in the hands of a body of men who will formulate regulations more in consonance with the advance of sanitary science rather than perpetuate the antiquated powers at present vested in the Water Companies.

It is hardly necessary to say that, in making this public statement, we are exclusively actuated by a desire to see the health of London advanced.

HENRY CARTER, C.E.,
The Sanitary Engineering Co.,
65, *Victoria-street, Westminster.*
EDWARD TIDMAN, C.E., F.S.I.
The London and Suburban Sanitary Survey Association.
34, *Victoria-street, Westminster.*
G. MAXWELL LAWFORD,
Assoc. M. Inst. C.E.
13, *Victoria-street, S.W.*
BANNER SANITATION CO.,
Manager, A. E. Hubert, M.S.E.
24, *Craven-street, Strand, W.C.*
February 6, 1897.

### "EXPERT EVIDENCE."

SIR,—Will you please allow me to correct the very inaccurate statement of your correspondent, Mr. Harvey Dyball, in this week's issue of your ournal?

Being the "fellow" alluded to, I beg leave to inform Mr. Dyball that I can prove my evidence to be correct from scientific data.

If he would take the trouble to test my statement, he may be wiser after his experiment than he is at present.

His whole letter is a garbled statement of my evidence, and does not contain one single fact.

February 5, 1897. T. L. FEARON.

* We are again compelled to hold over the remainder of our report of this Inquiry

## The Student's Column.

### SPECIFICATIONS.—VII.

CARPENTER.—(*continued.*)

*Quarter Partitions.*—Frame the quarter partitions on first floor with head sills and braces, 4½ in. by 3 in.; posts, 4½ in. by 4 in.; quarters and puncheons, 4½ in. by 2½ in.

The trussed partition over drawing-room to be framed with queen post truss as sketch (give sketch in margin showing in single line the timbers forming the truss), with tie beam 7 in. by 4½ in., and the remaining timbers shown in sketch, 4½ in. by 4 in. Put 1½ in. by ¼ in. wrought iron straps 30 in. long to feet and 24 in. long to heads of queen posts, with gibs and collars, and 2 in. bolts 14 in. long, with head, nut and washer to feet of principals, fixed solid through tie beam.

*Ceiling Joists.*—Put 4½ in. by 2 in. ceiling joists over bedrooms on first floor.

*Trap Doors.*—Trim for trap doors where indicated on plans; one over bedroom corridor 2 ft. 6 in. by 2 ft., and one on roof 2 ft. 9 in. by 2 ft. 3 in.

*Cupola roof.*—Construct the octagonal roof of cupola over vestibule as shown in detail drawing, with principal ribs at angles 7 in. by 2½ in., intermediate ribs, 5½ in. by 2½ in. These ribs to be fitted up to curve with stuff of 2½ in. thickness, spiked on. The principal ribs to be bolted to curb 6 in. by 4½ in., with ¾ in. wrought-iron bolts. Posts of lantern to be 6 in. by 4½ in. wrought and worked to sunk faces. Head and braces 4½ in. by 4½ in. Rafters 4½ in. by 2 in. Finial out of 4½ in. by 4½ in. turned and moulded, and with turned ring out of 2 in., cross-tongued, and fitted to finial. Head to be scarfed at angles, and bolted to posts with 8 in. coach screws. Balusters to be out of 2½ in. by 2½ in., turned and moulded, and spandrils out of 2½ in. wrought, cross-tongued shaped, and moulded on lower edge and framed to posts and heads with oak dowels to balusters. Sashes to lantern to be 1¾ in. ovolo moulded fixed sashes, with shaped heads. Ceiling joists under cupola to be 4½ in. by 2 in.; plates, 4½ in. by 3 in. Put 1¼ in. wrought and cross-tongued apron lining with moulded condensation gutter out of 4¼ in. by 2 in. The moulded cornice above sashes of lantern to be out of 7 in. by 1¾ in., bracketted, and screwed to framing.

*Dormers.*—The dormers on main roof to be formed with front of 4½ in. by 4½ in. wrought, rebated, and twice moulded posts, 4½ in. by 4 in. wrought, rebated, and moulded head, 6 in. by 4 in. oak sunk, weathered, rebated, and throated sill. These dormers to have rafters 3½ in. by 2 in., plates 3 in. by 3 in., ceiling joists 3½ in. by 2 in., ridges 5½ in. by 2 in., hips and vallies 7 in. by 2 in., cheeks to be framed with studs 3 in. by 2 in. The roof and cheeks of dormers to be covered with inch rough boarding and felt, as described to main roof. The eaves to be (describe according to the plan adopted for main roof, see p. 129 *ante*) and to have deal moulded cornice out of 4½ in. by 2 in. mitred at angles, and screwed to framing. The casements to be 2 in. ovolo moulded with sash-bars 1¼ in. wide, hung with 3 in. wrought-iron butts, to open outwards, and to have 12 in. japanned iron casement stay-bar with stub-plates and japanned iron cockspur fastening. Edges of casement and sides of frame to be throated to form water-stop. Bottom rail of casement to be splayed, rebated, and throated. Finish inside with 1¼ in. by 3 in. moulded architrave, and 1¼ in. rounded window board 6 in. wide, tongued to oak sill. Window back to be formed with 3½ in. by 2 in. ashlaring for plastering.

*Verandah.*—Construct the verandah as shown on detail drawing, with all visible and exposed woodwork of carefully-selected Riga fir of "best middling" quality, wrought with a clean finished surface. Posts to be 5 in. by 5 in., with 4 in. by 1½ in. moulding planted on, and ¾ in. by 7 in. chamfered plinth. Heads to be 5 in. by 4 in., and the curved filling pieces to be 2 in. thick, cross-tongued, cut to shape, and moulded on edge. The posts to have 5 lbs. lead seatings and dowels of inch wrought-iron barrel, 4 in. long, mortised into posts and stone bases. The roof over verandah to be constructed with 4½ in. by 2 in. rafters, 1½ in. pitching piece, 5½ in. by 3 in. hips, and to be covered with 1½ in. by 1 in. battening, set out to 3½ in. gauge for tiling. The eaves to have sprocket pieces out of 18 in. by 3 in., and feet of rafters to be cut to shape, as shown in detail.

*Fencing and Gates.*—Put at back of site open pale fencing, 4 ft. 6 in. high from ground, with oak posts 9 ft. apart, one pair of fir arris rails out of 3½-in. by 3½-in. and 3-in. by 1-in. sawn deal pales, 2¼ in. apart, with pointed ends, and to stand 2 in. clear of ground at bottom. The oak posts to be cut out of trees not less than 9 in. diameter, the parts below ground to be left full size and charred, and every third post to be set in concrete block at least 6 in. wider each side than heel of post. The remaining posts to be well rammed. The fencing and posts to be twice tarred with Stockholm tar at completion.

Put at sides of site oak pale fencing 5 ft. 6 in. high, with 6-in. by 4-in. posts, two arris rails out of 4½-in. by 4½-in. and gravel board 9 in. by 1½ in., filled in with cleft oak pales lapped and nailed to rails. The feet of posts to be well tarred in gas tar before fixing.

(N.B.—Alternative treatment of feet of posts is specified in this and preceding clause for the sake of example. With oak posts the first method is generally preferable.)

Put to openings in . . . 2½ in. framed, ledged and braced oak dwarf open gates with cut and moulded horns to stiles put together with white lead, and pinned with oak trenails. The gates to be hung with a pair of purpose made wrought iron strap hinges 24 in. long, with ornamental heads to detail to 5 in. by 5 in. wrought and rebated posts with turned and moulded finials out 6 in. by 6 in. and 15 in. long dowelled to posts. Each gate to have strong wrought iron purpose made gate latch to detail.

*Summer House.*—Construct the rustic summer house as shown on drawings with oak sill, 6 in. by 4 in. laid on 6 in. bed of cement concrete, sides constructed of larch saplings, average 3 in. diameter, halved where shown on drawings to cross each other, put together in white lead, and pinned with oak trenails. The roof to have 4½ in. by 2 in. rafters, 4½ in. by 2 in. collars dovetailed and spiked to rafters, 9 in. by 2 in. ridge and hips, and 4 in. by 3 in. plate. Under side of rafters and collars to be lined with inch matched and V-jointed boarding in half batten widths. The roof to be covered with thatching of oaten straw, 18 in. thick, properly tied and secured. Put around sides of summer-house, internally, 1½ in. elm seat with 2 in. shaped elm brackets and inch elm skirting board around. Provide for flooring lattice grating of 1½-in. by 1-in. teak battens, halved and pinned with 1½-in. meshes, and formed in sections about 6 ft. superficial each, as shown on plan, and to have framed and curved teak bearers 1½ in. thick under edges of each section.

There are, of course, many other structures which come within the carpenter's province in special cases which must be dealt with separately, but the specimens already given should serve as a sufficient guide to the student.

### *OBITUARY.*

MR. S. D. BUTTON.—Stephen Decatur Button, perhaps the oldest practising architect in the United States, has just passed away in his eighty-fourth year. Born in Preston, Connecticut, during the exciting times of a war with England, and at a moment when the naval exploits of Commander Stephen Decatur proved victorious over the English, the infant son of Roswell Button (then serving with his regiment of Militia as one of the defenders of the Port of New London) was named after the hero of the hour. Passing his early boyhood on his father's farm, he was apprenticed at sixteen to learn carpentry with his uncle, a prominent builder in those days; here he thoroughly acquainted himself with practical building construction, learned geometry, and industriously studied the "five orders." At the age of twenty-one he went to New York, and became assistant to George Purvis, a Scotchman from Edinburgh, who had been a pupil with Cubitt Bros., of London, and one of the four or five qualified architects at that time settled in the United States. The style of design most in vogue with them was that which was being mainly upheld in England by Sir William Chambers and his pupils. In America at this period it was quite customary for the architect to design and to undertake the contract for building his work, therefore upon leaving Mr. Purvis, Mr. Button in this way planned and erected many private houses, churches, and other public buildings in the States of Pennsylvania, New Jersey, Florida, and Georgia. When about the age of thirty-

one he won in competition the State House at Montgomery, Alabama, and spent two years in superintending its erection, returning north in 1848 to Philadelphia, to settle there and practise his profession for nearly half a century. In that city he designed many of its most important business buildings. Railroad offices, ferry-houses, markets, banks, insurance buildings, theatres, museums, churches, office buildings, and many fine residences, also large hotels at several fashionable seaside resorts, besides county asylums, city halls, churches, schools, and residences in various towns and cities of the adjoining States, Pennsylvania, and New Jersey. During all this busy life, and notwithstanding the lack—natural in a comparatively young, unsettled country—of public appreciation for the art of architecture, Mr. Button laboured continuously, with a genuine enthusiastic love for his profession, above all sordid considerations, and though his design was more influenced by the Italian Renaissance than by the Gothic styles, still his church buildings displayed good, simple effects gained by fine proportion, without over-elaboration of detail. Enthusiastic himself, he was the source of enthusiasm in others; his numerous pupils and assistants, who in the course of fifty years have done service with him, are now widely spread through the prominent cities of the States, all spontaneously testify to the kindly, helpful spirit invariably manifested towards them as students, and bear witness to a character in their master singularly generous, cheerful, and inspiring. Not a few mechanics and craftsmen owe their successful, advanced positions to his guidance, encouragement, and even substantial assistance, freely bestowed to influence their efforts in their younger days. Mr. Button, on entering upon his eightieth year, with his courteous manner, his genial sympathies, and his youthfulness of spirit preserved up to date, elicited from his professional brethren in Philadelphia, and old-time pupils in other cities, a mark of honour and esteem in the form of an elegantly illuminated address on vellum, as follows: "Presented to Stephen Decatur Button, June 8, 1892, by brother architects, desiring to congratulate him on entering the eightieth year of his age, as an expression of their respect for an honourable career extending over half a century, and remarkable for many important public works, executed with integrity before clients and fellow-citizens, joined with an unassuming, courteous bearing, a self-abnegation combined with generous helpfulness, and an ever ready counsel for his younger associates, to whom he has endeared himself as a model of right-minded and faithful dealing." Mr. Button was an industrious student of geology, and his large collection contained many valuable specimens. He possessed a library of fine architectural works, which he some time ago presented to the Philadelphia Chapter of Architects, of which society he was the oldest member. He leaves a son, William G. Button, a civil engineer, and a daughter, Maria Button, an artist of considerable ability.

MR. JOHN FAULKNER.—Mr. John Faulkner died in his seventy-fourth year on the 7th inst. at his residence in Strangeways, Manchester. He had been connected with electric science for upwards of sixty years. He was one of the first to introduce a perfect system of conductors for the protection of buildings from lightning. His "electric kite" was applied in early days to high steeples and tall chimneys. One of his earliest applications of electricity was made in connexion with signals and bells for coal mines. In 1875 he invented improved electric magnetic telegraph sounders and bells. One of these sounders was adopted by Professor Bell in his earliest telephonic experiments, and was first exhibited at the Centennial Exhibition at Philadelphia in 1876.—*Manchester Guardian.*

## *GENERAL BUILDING NEWS.*

METHODIST CHAPEL AND SCHOOL, ARMLEY, YORKSHIRE.—Memorial stones were laid recently of a new Methodist chapel and school at Armley. The cost of the projected buildings, including land, is estimated at 3,577*l.* Mr. W. S. Braithwaite is the architect, and Mr. Walter Lolley is carrying out the brick and stonemasonry work. The chapel will have a tower at the north-west corner, and is intended to accommodate 410 persons. A school 52 ft. by 28 ft., with four class-rooms, preaching-room, minister's vestry, and caretaker's house, is to be added. The buildings will be of brick with stone dressings.

INFECTIOUS HOSPITAL, KEIGHLEY.—The infectious diseases hospital at Morton Banks, built by the Keighley and Bingley Joint Hospital Board, was formally declared open on the 2nd inst. The buildings comprise an administrative block, in which accommodation is furnished for the matron and staff; an isolation block, with accommodation for six adult and two child patients; the scarlet fever block, large enough for twelve adults and twelve children; a block containing the laundry machinery and disinfecting apparatus, a mortuary, and a porter's lodge. The work of laying out the grounds is in progress, and there yet remains the building of the typhoid fever block. The buildings have been erected from the plans of Messrs. J. Judson & Moore, architects, of Keighley, and Mr. R. Armistead, of Bingley, has acted as the surveyor to the Hospital Board.

MOUNT FLORIDA SCHOOL, GLASGOW.—This school is being erected for the Cathcart School Board, and it will accommodate 1,200 scholars when finished. There are cookery and piano rooms in addition to all the others, with a janitor's house in the basement. The school is Classic in design, and is two to three stories in height. The architect is Mr. Barclay.

CHURCH SCHOOLS, LEWES, SUSSEX. — New Church schools at the Pells, Lewes, were opened recently. There are two blocks of buildings, one block being the boys' and girls' schools, which are under one roof, while the other is for the infants. The entrance to both schools is by stone porches, and immediately inside of the porches are provided cloakrooms. The accommodation for the girls comprises a room about 43 ft. long by 20 ft. wide, and also a class-room. The boys' school is divided from the girls' school by a glass-panel door, and is of the same dimensions as the girls' school. It has also a class-room. There is accommodation for about 100 boys and 100 girls. The infants' school is on the south-west side of the main entrance, and is about 63 ft. by 22 ft., with accommodation for 210 children. There are two class-rooms leading from the main room. The architect was Mr. R. Creed, of London; Messrs. Stewart & Sons, of Wallington, were the builders.

PRIMITIVE METHODIST CHAPEL, NEW BROMPTON.—The trustees of the P. M. Chapel, New Brompton, Kent, have approved of sketch plans for a new chapel and Sunday schools to be built upon a site where the existing iron church stands (Gillingham-road), and have instructed their architect (Mr. E. J. Hammond, New Brompton) to proceed with plans and specification forthwith.

ADDITIONS TO ASSAY OFFICE, BIRMINGHAM.—Additions are being made to the Birmingham Assay Office. Messrs. Ewen and J. Alfred Harper are the architects. Mr. Briley is the builder, and the floors are fireproofed on the Fawcett system.

BUILDING IN ABERDEEN.—Plans of new buildings representing a total value of about 9,000*l.* were submitted to the Plans Committee of the Aberdeen Town Council at its meeting on the 29th ult. One of the plans was that of a school to be erected in St. Swithin-street, in connexion with the Convent of the Sacred Heart. The cost of the school will be about 1,000*l.*

CHURCH INSTITUTE, OTTERY ST. MARY, DEVONSHIRE.—The opening of the new hall of the Ottery St. Mary Church Institute took place recently. The hall is 60 ft. by 30 ft., rising to a height of about 26 ft. The contract was entrusted to Mr. F. Williams, and the architect was Mr. E. G. Warren, of Exeter.

BUILDING IN BLACKPOOL.—At the meeting of the Blackpool Building Plans Committee, on the 29th ult., 78 plans were gone through, 43 being approved and 35 disapproved.

CONSTITUTIONAL CLUB, OVENDON, YORKSHIRE.—The Halifax Corporation have passed plans prepared by Mr. J. F. Walsh, architect, Halifax, for a new Constitutional Club, which it is proposed to erect on a plot of land on Park Lodge Estate, Ovendon. Advantage is taken of the natural fall of the ground to form a lower floor level to Campbell-street. This space will be occupied by a caretaker's house, a public entrance to the club rooms, supper room, cooking kitchen, servery, ladies' and gentlemen's cloak rooms and retiring rooms, heating apparatus, and bath room for the use of the members. The assembly hall is approached by a flight of steps from the lower level, with an extra entrance on the north side of the room, and also from the club premises. The assembly hall is 36 ft. by 68 ft., and will provide sitting accommodation for over 500 people. It will be fitted with a spring dancing floor, a platform, and the usual retiring rooms. The supper room is 25 ft. by 36 ft., and will provide accommodation for upwards of 100 people. The club entrance is in the centre of the site in Wheatley-lane. The club premises proper consist of a reading room, 30 ft. by 20 ft., a committee room, and a bar 12 ft. square, on the ground floor. On the first floor there will be a billiard room, a games room, with lavatories and conveniences. There will be a hall and vestibule at the members' entrance.

DRILL HALL, GLASGOW.—The new drill hall and headquarters of the 1st V.B. Highland Light Infantry were opened on the 22nd ult. by General Chapman, commanding the Scottish District. The halls are situated at the corner of Hill-street and Rose-street. They have been built from designs prepared by Mr. Horatio K. Bromhead. The most prominent feature of the structure is the corner tower, in which is provided a house for the caretaker. The main entrance to the halls, which is from Hill-street, leads by an inclined plane of easy gradient to the drill hall, situated on the upper floor. The hall measures 100 ft. by 120 ft. long. The walls are pierced with loopholes, and light is supplied from the roof. The roof is constructed of steel. On the ground floor there is a concert hall measuring 68 ft. by 40 ft., with retiring rooms adjoining. In the western section of the building, entered from Rose-street, are club-rooms, gymnasium, and reading-room. The east front is devoted to the officers' quarters, which have a separate entrance from Hill-street. Accommodation is also provided on this floor for the sergeants' mess, staff-sergeants' room, armoury, and quartermaster's office, and in the basement are the quartermaster's store, &c., as well as a range for Morris tube practice.—*Glasgow Herald.*

REPAIR OF METHODIST CHURCH, BELFAST.—Falls-road Methodist Church, Belfast, has just been reopened after undergoing repair. The builders are Messrs. J. Lowry & Sons, and the work has been carried out under the superintendence and from the plans of Messrs. J. J. Phillips & Son.

BANK, COCKERMOUTH, CUMBERLAND.—The directors of the Carlisle and Cumberland Bank, Limited, propose erecting a new bank in Main-street, Cockermouth, opposite the Globe Hotel, and have accepted tenders for the erection of the new premises. Mr. George Dale Oliver, Carlisle, is the architect.

VESTRY, TYLORSTOWN.—The memorial-stones of a new vestry at Tylorstown, in connexion with Hermon Baptist Church, Pontygwaith, were laid recently. The vestry, which cost 1,100*l.*, has been erected by Messrs. E. Davis & Sons, Treherbert. The architects were Messrs. Griffiths & Jones, Tonypandy.

## *SANITARY AND ENGINEERING NEWS.*

SEWERAGE SCHEME, NEWPORT PAGNELL.—The Newport Pagnell Rural District Council have instructed Mr. D. Balfour, of Newcastle-on-Tyne, to prepare a scheme of main sewerage and sewage disposal for the town of Newport Pagnell, Buckinghamshire, to obviate the pollution of the rivers Ouzel and Ouse.

WATER SUPPLY, DOUGLAS.—A few months ago Mr. Hill, water engineer, was instructed to report on the water supply of Douglas, with a view to provide means for an extended supply, if, in his opinion, it should be found necessary. Mr. Hill's report has been received. He lays it down that, in view of the increasing population of the town, an increased water supply is absolutely necessary. He suggests two alternate schemes for the purpose of extending the supply. One is the construction of a reservoir at the lower end of Ballacottier stream, Onchan. He estimates that the reservoir could be constructed at this place to hold 105,000,000 gallons for 47,000*l.* to 48,000*l.* The other scheme is to construct a reservoir in West Baldwin valley. That site is admirably adapted for a reservoir, with a broad base, and he estimates that one could be constructed here to hold 300,000,000 gallons at a cost of about 49,500*l.*, or only 1,500*l.* more than the cost of the suggested reservoir at Ballacottier, while its capacity would be nearly three times greater. The engineering difficulties in connexion with West Baldwin scheme are much less than those of the Ballacottier scheme, inasmuch as the retaining embankment at West Baldwin would not be more than quarter the length of that which would be required at Ballacottier. The great difficulty with regard to the West Baldwin scheme arises from the enormous pressure which would result from the height of the reservoir above the town, and the engineer suggests, as a means for getting over this difficulty, that a main should be laid over West Baldwin, and join the existing main at Parkfield, the residence of Mr. Heron, the height of which above the town is only 200 to 300 ft.—*Liverpool Mercury.*

WYLES'S PIPE-JOINT.—This is a patented method of jointing iron, earthenware, and other pipes, but as the only novelty consists in tapering the spigots of the pipes, and in making the sockets slightly conical, we fail to see that it will prove of much service. In the case of pipes with thin walls, the taper could only be of the slightest, and, in any case, the advantage gained by tapering the spigot is not manifest.

## *ELECTRIC LIGHTING NEWS.*

ELECTRIC LIGHTING AT WALLASEY. — The supply of electric light for the district of Wallasey was inaugurated on the 29th ult., when the electrical station in Seaview-road, Liscard, was formally opened. The new electric light works adjoin the water pumping station, and the District Council have economised the mechanical power in their possession, so that the existing machinery can be utilised for providing the supply of electricity to the district. The scheme was suggested by Mr. J. H. Crowther, the engineer and manager of the council's gas works. The contractors for the work at the new station were—for engines, alternators, and switchboard, Messrs. S. Z. de Ferranti, Limited, Hollinwood and London; for cables, Messrs. the British Insulated Wire Company, Limited, Prescot; and for buildings, Mr. John Gourley, Liscard and Liverpool.

PROPOSED ELECTRIC LIGHTING OF PUBLIC STREETS IN LEEDS.—The Lamp Committee of the Leeds Corporation are contemplating lighting the principal thoroughfares in the central parts of the city by electricity. They propose to place arc lamps on the poles that are to be used to support the overhead wires for the electric system of tramways. It has also been suggested that the requisite electrical current for lighting should be obtained from the central generating station at Crown Point.

ELECTRICITY AT SOMERSET HOUSE.—Somerset House, it is stated, is to be lighted throughout by electricity. A scheme of installation, involving a total expenditure of 8,000*l.*, has been sanctioned by

the Treasury; and the Estimates of 1897-8 will provide for a payment on account of 2,500*l.* for that portion of the work scheduled for completion by the end of the next financial year.

## *FOREIGN.*

FRANCE.—The President formally opened last Sunday the new Rue Rèaumur, which was decreed as of "public utility" as long ago as 1864, but the completion of which was not decided on till 1892. The work has been carried out by M. Henri Maréchal, an engineer of the "Ponts et Chaussées," who is specially attached to the municipal service of Paris.——The jury in the Ecole des Beaux Arts competition of the First Class, for which the subject was "a *suite* of reception-rooms," has awarded First Medals to M. Wolff, pupil of M. Redon; M. Senés, pupil of M. Raulin, and to M. Paul Guadet, pupil of MM. Guadet and Paulin.——Among 700 projects in connexion with the 1900 Exhibition, brought forward by private speculators, the Committee has licensed eighty-four, most of which are panoramas of one kind or another; one is for a sliding railway (iron), and one for a moveable platform or sidewalk.——The Louvre has just acquired a Christ, carved in wood, by Alonzo Cano, and one of his finest productions.——A committee has been formed to erect a monument at Paris to the poet Alfred de Vigny.——The crematorium at Père Lachaise is at last to be completed, as well as a columbarium or repository for urns, in connexion with it. M. Formigé is the architect. —— A competition has been opened by the municipality of Brunoy (Seine-et-Oise) for a new Hotel-de-Ville. Sixty-one designs have been sent in, and will be on view till the 20th.——M. Riondel, architect, of Grenoble, has been elected president of the "Société Regionale des Architectes" of Dauphiné.——The National Fine Arts Exhibition at Bourges is to open on May 15, to remain open for one month. The thirteenth exhibition of the "Union Artistique" of Toulouse will be open from February 25 to March 5; and the tenth annual exhibition of the Fine-Art Society of Lyons will be open from March 4 to May 2.——The "Union Artistique du Nord" will open, at Lille, from April 1 to July 1, an exhibition of industries and arts applied to the habitation.

GERMANY.—Messrs. Kayser & von Grossheim have received the first premium in the competition which has been held at Berlin for a new Royal Academy of Arts and an Academy of Music. The value of this premium is 400*l.* A premium of equal value, and bracketted with the first, has been given to Herr Adolf Hartung, of Berlin. The next two premiums were given to Baurath Eggart and Schwechten respectively, and there were also a number of minor premiums. There were thirty-two candidates.

## *MISCELLANEOUS.*

LEEDS SLUMS.—The sub-committee of the Leeds Corporation, which was specially appointed a short time ago for the purpose of making recommendations as to the best manner in which to deal with the property in the "insanitary areas" of the city, met at the Leeds Town Hall on the 1st inst., and discussed details connected with the scheme for dealing with the property situated in what is known as the York-street area. According to the Housing of the Working Classes Act, the Corporation are bound to provide dwellings for the inhabitants—or, at any rate, a certain proportion—whom they displace by the demolition of the insanitary dwellings. In the present case the Corporation are compelled to provide housing accommodation for 2,000 persons. The Act does not stipulate that this provision shall be necessarily made within the area that is being dealt with, but it must be within a reasonable and convenient distance. Many members of the committee favoured the idea of having a number of the tenement houses that will be required erected on the Ivy House Estate, a site belonging to the Corporation, adjoining the East End Park, and a distance of about three-quarters of a mile from the present terminus of the York-road tramway. It was pointed out that the Highways Committee had already decided to extend the tramways in the direction of the park, and with such tramway facilities, it was thought the Local Government Board would not raise any objection to the proposal. Whether that be so or not, the sub-committee have resolved to obtain the opinion of the Local Government Board on the subject. As to dealing with the property in the condemned area, the committee appointed two sectional committees for negotiating with the property owners affected by the scheme, together with valuers. A third sectional committee was formed to consider how best to deal with the licensed property in the area. The Engineer to the Committee (Mr. Carter) was instructed to visit Barrow and Manchester, to inspect the tenement dwellings that have been erected by those Corporations, and to report thereon to the next meeting of the sub-committee.—*Leeds Mercury.*

CASSELS' WASH-BASIN RANGE. — This is a water-saving lavatory range for schools, reformatories, &c. It consists of a trough, in the bottom of which are formed a number of small basins just large enough to admit of emersing the hands freely. A copper pipe, passing below, is connected to the bottom of each basin by a brass inlet. When, at washing time, the attendant turns on the water supply, it fills each basin and overflows all round the rim into the trough, whence it is discharged by a grated outlet to the drain. The basins being so small, the water in them is quickly changed by the supply from the bottom, while the constant overflow at the top of the basin carries off at once all the soapy and dirty water. One basin in a range can be fitted with a separate supply valve for occasional use by individuals. As long as the general use of the lavatory is confined to stated periods, under the management of an attendant, this seems to be a good system for such places as reformatories and lower-class schools and factories; but it presupposes attendant having control of the water-supply.

MASTER BUILDERS' ASSOCIATION DINNER, SHREWSBURY.—The fifth annual dinner in connexion with the Shrewsbury and District Master Builders' Association was held at the Lion Hotel recently. Mr. H. Farmer presided, in the absence of the President, Mr. R. Price, and Messrs. Gethin and T. Morris occupied the vice-chairs. After the usual toasts had been honoured, Mr. T. S. Harris proposed the toast of the town and trade of Shrewsbury. Mr. J. A. Lea responded. Mr. Morris proposed the health of the President and Vice-Presidents, and said that there was no dearth of trade in the building trade, which brought more business into the town than anything else. Mr. Farmer replied. Other toasts followed.

SURVEYORSHIP APPOINTMENT.—A meeting of the Batley Corporation was held at the Town Hall on the 4th inst., the Mayor (Ald. Nettleton) presiding, when a resolution of the General Works Committee, to appoint Mr. Oscar J. Kirby as Borough Surveyor, at a salary of 250*l.* per annum, subject to his resigning the office of Waterworks Manager, was confirmed after a long discussion.

MASTER BUILDERS' ASSOCIATION, TUNBRIDGE WELLS.—A meeting of the builders of Tunbridge Wells, Southborough, and district, convened by circular, was recently held in the Committee Room of the Town Hall, Tunbridge Wells, when there was a large attendance, presided over by Mr. C. M. Strange. It is stated that it was unanimously decided to form a Master Builders' Association, and some twenty-eight firms were enrolled. Mr. Mansfield (Messrs. G. Mansfield & Son) was elected President; Mr. C. J. Gallard, Vice-President; Mr. J. Jones (Messrs. Soper & Jones), Hon. Treasurer; and Mr. E. J. Strange (Messrs. Strange & Sons), Hon. Secretary. The committee was constituted as follows:—Messrs. J. Crates, J. Jarvis, W. E. Judd, W. B. Jury, T. Hudson, and C. M. Strange, and they were deputed to frame a code of rules for the Association.

BRISTOL MASTER BUILDERS' ASSOCIATION DINNER.—On the 2nd inst. the annual dinner of the Bristol Master Builders' Association was held at the Royal Hotel, College-green, under the presidency of Mr. C. A. Hayes. The loyal toast having been proposed by the President, Mr. G. Humphreys proposed "The Mayor, High Sheriff, and Corporation of Bristol." He regretted the loss which the local Association had sustained in the last year by the death of Mr. W. H. Cowlin, one of their members who was in the Municipal Council. They had now the Sanitary Committee doing much of the work which used to be done by the builders; but he believed it would be for the benefit of the ratepayers if the work were done by contract. In putting the Sanitary Committee in competition with the builders, there should be no extraneous pressure put upon contractors that would not be put upon the Sanitary Committee itself, and all fair charges should be put down against the Sanitary Committee.—The High Sheriff (Mr. J. C. Godwin) responded. Mr. J. Bastow also spoke to the toast. He said that he believed there was much of the work done by the Sanitary Committee which ought to be done by the master builders; but he did not sympathise with the demand that everything should be done by the builders. The Committee must make roads and drains and other matters in the interest of the public. —Mr. E. Walters gave "The Architects, Engineers, and Surveyors." Mr. Frank Wills responded. Mr. J. Holman (Vice-President of the Chamber of Commerce) proposed "The National Association of Master Builders." He saw that among the matters they discussed was uniformity of contracts, and that was most essential. Arbitration was another question which came before them, and he was glad they attempted to bring it into their business. He had found arbitration very much quicker and far less costly than an appeal to the law courts. Mr. A. Krauss, in responding to the toast, said that during the last twelve months they had had few strikes in the building trade, and in Bristol none. The few differences that did arise there were speedily settled by their Conciliation Board. They all looked forward each year for less strikes and lock-outs. It gave him much pleasure to tell them that the next half-yearly meeting of the National Association of Master Builders of Great Britain would be held in Bristol. His Worship the Mayor had already placed at the disposal of the Association the Civil Courts for the business proceedings, and he trusted they would have a very successful meeting. —Mr. W. Church also acknowledged the toast. He said that the President of the National Association had spoken about the ruinous competition that was going on between master builders, and the cut-throat efforts for the job they would get. If they could only come to some understanding between themselves to prevent that ruinous competition which was going on their meetings would be of great advantage to them all.—Mr. E. G. Clarke proposed "The Bristol Master Builders' Association." The President (Mr. Hayes) returned thanks, and he said their Association was to assist as far as possible in settling disputes in the best manner with the workmen. In the past year there had been three disputes in various trades, and they were settled amicably, which prevented more trouble. Mr. W. H. Brown proposed "The Kindred Associations." Mr. E. W. Wooster (President of the Bath Master Builders' Association) in acknowledging the toast, said the building trade had been more flourishing of late years, and a good deal was accomplished by their Associations. Mr. E. J. B. Mercer (Secretary to the Bath Master Builders' Association) responded, and adverted to the advantage of being federated with the National Association. The High Sheriff proposed the health of the President, and Mr. W. Church, the new Vice-President, was subsequently inducted to the vice-chair, and he acknowledged the honour done him. Mr. F. Cowlin then proposed "The Builders' Merchants," and Mr. Arthur Lee responded.

PLYMOUTH, &c., MASTER BUILDERS' ASSOCIATION DINNER.—The President (Mr. R. G. Jenkin) presided at the annual banquet of the Plymouth, Stonehouse, Devonport, and Neighbourhood Master Builders' Association, held at the Royal Hotel, Devonport, on the 3rd inst. The loyal and patriotic toasts having been honoured, "Our Municipalities" was given by the Chairman, who observed that they took a very keen interest in their municipalities, their movements, and their working, for they found what went on within the inner chambers affected them very much. He associated with the toast the name of Mr. A. B. Pilling, the new Town Clerk of Devonport. Mr. Sowerby gave the toast of "Success to the Master Builders' Association and the Building Trade." Mr. E. Pile replied on behalf of Devonport. Mr. H. Kerswill and Mr. Turpin also acknowledged the toast, and pointed out that it was only by combination and standing shoulder to shoulder, as the men did, that they would secure success. Mr. W. G. Wakeham, C.C., submitted "Trade and Commerce," and Mr. J. Cole and Mr. T. Dennis responded. Mr. N. Coles gave the health of "The President." The Association had been formed fifteen years, and this was the first occasion on which a President had been elected outside Plymouth. Referring to the labour difficulty looming in the distance, the speaker said they did not want any strike to take place in the Three Towns. If the building trade was stopped, almost every business suffered. With regard to the erection of working men's dwellings, he maintained that that matter should not be undertaken by public bodies. As builders, they had their living to get, and if public bodies took up building it was taking away the living of the builders. The houses built at Prince Rock would not pay 2 per cent. on the outlay. No one could turn out work so cheap as a contractor, and, as an illustration of this, he said that two jobs cost the Plymouth Corporation 250*l.* above the contract price he (Mr. Coles) sent in. He strongly advocated an arbitration clause in their future contracts. The President acknowledged the toast, and, referring to the labour dispute, said that in the negotiations that had so far proceeded, the men had behaved themselves in a very decorous and proper manner. They showed every sign of being wishful to compromise and meet the matter in such a way as to avoid a strike. But there were principles upon which they (the master builders) did not intend to deviate or give way. The toasts of "The Visitors" and "The Press" concluded the list.

## *CAPITAL AND LABOUR.*

PETERBOROUGH CARPENTERS AND JOINERS.—There is an agitation among the carpenters and joiners of Peterborough for an advance in wages. The members of the trade consider they are entitled to an advance on the same grounds as those on which the bricklayers of the city obtained concessions last year. No strike is intended at present, but a petition will be made for an increase, which in a few instances, it is stated, has already been granted by employers.

LABOURERS' WAGES, WOLVERHAMPTON.—At a meeting on Monday last week the members of the Wolverhampton Master Builders' Association agreed to concede an advance of ½d. per hour to labourers, to take effect on April 1 next.

## *LEGAL.*

### CONTRACTORS IN THE DIVISIONAL COURT.

THE case of Murdoch and Cameron *v.* the Mayor and Corporation of Bournemouth, came before Mr. Baron Pollock and Mr. Justice Bruce, sitting as a Divisional Court of Queen's Bench on the 27th ult., for judgment, it being an appeal from the decision of the Official Receiver, sitting at Bournemouth, in an action arising out of the alterations and enlargement of the old pier at Bournemouth. The facts of the case sufficiently appear from the judgment.

Mr. Baron Pollock said that the learned Referee decided principally in favour of the defendants in the action which was brought by the plaintiffs, who are a firm of contractors carrying on business at Glasgow, to recover a considerable sum of money, being the price of work and labour done under a contract to enlarge the old pier at Bournemouth. The contract contained certain clauses which were not unusually found in contracts of such a nature. It was provided that the materials should be of the best quality, and if they became, during the term of maintenance defective, or damaged, so as to be imperfect in the terms of the contract, such portion should be forthwith remedied, and the work re-executed in an approved manner. The contract therefore provided for what was to happen during the term of maintenance. The contractors were also to guarantee the stability of the work and to maintain the works for twelve calendar months. The contractors had pleaded that damage had been done to the works by what was known as an "Act of God," but, said his lordship, although the winds and waves were unusually severe, these were nevertheless matters within the contract, and the learned Referee was right in negativing this defence. The defendants denied that the work was properly done and that the materials were insufficient, and the learned Referee found that there was due to the plaintiffs from the defendants in respect of the work 1,606*l.* 18s., but that there was due to the defendants from the plaintiffs upon the counter-claim 1,800*l*, leaving a balance due to the defendants of 173*l.* 10s. His lordship came to the conclusion that the learned Referee's decision was right, and that his judgment ought to be affirmed.

Mr. Justice Bruce concurred.

Their Lordships slightly varied the learned Referee's order as to costs. The plaintiffs, under the order, were given the costs of the claim, and the defendants the costs of the counter-claim; but their lordships now decided that as regarded paragraph 11 of the counterclaim there should be no costs on either side.

A stay of execution was granted for fourteen days, pending an appeal; but Mr. Baron Pollock remarked that he did not encourage the appeal, as he considered the case a very clear one. His lordship further said that the storm of wind had been, no doubt, responsible for a good deal of money, but the storm of law would probably be responsible for more.

## PARTY WALL DISPUTE AT HOUNDSDITCH.

THE case of Crux *v.* Bell came before Mr. Justice Romer in the Chancery Division on the 22nd ult., it being a motion by the plaintiff to continue an *interim* injunction to restrain the defendant from pulling down or interfering with the party wall between Nos. 143 and 142, Houndsditch, until an award had been made under the London Building Act, and otherwise than in accordance with that award.

The defendant, who appeared in person, asked for an adjournment so as to enable him to instruct Counsel and his solicitor. He said that he had taken up the award and paid all the fees. The plaintiff had filed two affidavits—which had been totally denied—stating that the wall had been interfered with. The building had never been touched, and as a fact the plaintiff was really not entitled to an injunction.

His Lordship: You only intend, I gather, now to proceed in accordance with the award.

The defendant replied that that was so, but the plaintiff had delayed him four months. The award was only made at three o'clock the previous afternoon, and at half-past three o'clock he took it up and paid the fees.

His Lordship: I will give you further time, but you must undertake not to deal with the wall, except in accordance with the award. Will you undertake until the trial of the action, or until judgment or further order, not to deal with the wall, except in accordance with the award?

The Defendant: Yes, my lord.

His Lordship: Well then, I will make the costs of this application costs in the action.

The Defendant: Then we can simply proceed with the building in accordance with the award?

His Lordship: Yes.

Mr. Terrell represented the plaintiff.

## A MOOT POINT UNDER A LOCAL IMPROVEMENT ACT.

THE case of the Mayor, &c., of West Hartlepool *v.* Robinson came before Mr. Justice Stirling in the Chancery Division, on the 30th ult., for reserved judgment, it being an application by the plaintiffs, who sought to establish and enforce against certain lands belonging to the defendant and abutting on two streets known as Murray-street and Sandringham-road, two charges for sums of 27*l.* 16s. 6d. and 328*l.* 3s. 4d. in respect of paving and sewering the two streets. The charges were claimed under the provisions of the West Hartlepool Extension Act, 1870, the questions at issue turning upon the construction of that Act, which, however, is substantially in the same terms as the Public Health Act, 1875. The defendant, in the year 1878, was the owner of the land in question, which formed part of the Lynfield Estate, which was, down to quite recently, occupied by him for residential purposes. The owners of the immediately adjoining land on the south were, in 1878, desirous of developing their property for building purposes, and applied to the plaintiffs' predecessors in title (the West Hartlepool Improvement Commissioners) to sanction a scheme for that purpose. They submitted a plan showing a proposed road 36 ft. wide, half on the land of the applicants and half on that of the defendant. The proposed scheme was sanctioned, and a road was made called the Sandringham-road, but in the first instance only 18 ft. wide, there being an agreement between the defendant and the Commissioners that he would thereafter contribute a sufficient quantity of land on the north to give a street 36 ft. wide. In January, 1892, the Corporation made an order for the paving and sewering of the roads in question being 18 ft. wide, notice of which was served on the defendant and the other owners; but none of the owners executed any part of the works, and the Corporation proceeded to do them themselves. The Borough Surveyor apportioned the cost of the works, the above-mentioned amounts being charged against the defendant; and on his refusing to pay, the present summons was taken out. It appeared that the defendant had afterwards thrown the agreed portion of his land into the road, making it 36 ft. wide, and that he had done the necessary work of paving, &c., of that portion of the road; the claim in dispute being for the apportioned cost of making the 18 ft. of road which was not upon his land at all. The most material defence raised was that the order of the Corporation was inoperative, inasmuch as the defendant had no means of obeying it without committing a trespass by going upon land which did not belong to him.

His Lordship, in giving judgment for the plaintiffs, said that the statute had imposed on persons whose lands abutted on a street certain duties, for the discharge of which it was necessary that they should enter on the street, and those duties were imposed irrespective of the circumstance whether those persons were or were not the owners of the soil of the street. Acts done in discharge of those duties could not, in his Lordship's opinion, constitute a trespass.

Mr. Buckley, Q.C., and Mr. Druce appeared as counsel for the plaintiffs; and Mr. Graham Hastings, Q.C., and Mr. Strachan, Q.C., for the defendant.

## LEEDS LIGHT AND AIR CASE:

### ACTION BETWEEN BANKS.

THE case of the London and Midland Bank *v.* the National Provincial Bank of England, Limited, was mentioned to Mr. Justice North in the Chancery Division on the 5th inst., it being a motion by the plaintiffs to restrain the defendants from building a new bank in Park-row, Leeds, opposite the plaintiffs' premises, so as to interfere with the plaintiff's light and air.

Mr. Bryce, Q.C., for the defendants, said that his clients were anxious to complete their building by putting the roof on it. This would only necessitate going 4 ft. higher which could hardly injure the plaintiffs, and they (the defendants) would undertake to pull down whatever was ordered by his Lordship at the trial, if any pulling down were ordered.

Mr. Clode, for the plaintiffs, said that the defendants had given an undertaking over that day not to build any higher, and he should ask that that undertaking be continued until the motion was effective or until further order.

After some argument his lordship ordered the case to stand over till the 12th inst., the defendants in the meantime to continue the undertaking not to build any higher, the plaintiffs also giving an undertaking in damages in case the defendants should be proved to have suffered any.

Order accordingly.

## MEETINGS.

FRIDAY, FEBRUARY 12.

*Institution of Junior Engineers* (*Westminster Palace Hotel*).—Paper on "The Construction of High-class Bridge and Girder Work," by Mr. J. A. Macpherson. 8 p.m.

*Royal Institution.*—Professor John Milne, F.R.S., on "Recent Advances in Seismology." 9 p.m.

*Institution of Civil Engineers* (*Students' Meeting*).—Mr. H. W. Barker on "Cooling Reservoirs for Condensing Engines." 8 p.m.

SATURDAY, FEBRUARY 13.

*London and Provincial Builders' Foremen's Association.*—Annual Dinner, Holborn Restaurant. 7 p.m.

*Edinburgh Architectural Association.* — Visit to Broughton School.

MONDAY, FEBRUARY 15.

*Royal Institute of British Architects.*—Mr. H. E. Milner on "The Garden in Relation to the House." 8 p.m.

*Society of Arts* (*Cantor Lectures*).—Mr. C. F. Cross, F.C.S., on "The Industrial Uses of Cellulose." I. 8 p.m.

*Sanitary Institute* (*Lectures for Sanitary Officers*).—Introductory lecture, on "Factory Legislation," by Dr. A. Wynter Blyth. 8 p.m.

*Leeds and Yorkshire Architectural Society.* — "An Architectural Student's Rambles between Wakefield, Doncaster, and Selby," by Mr. R. A. Easdale. Illustrated. 7.30 p.m.

*Northern Architectural Association.*—Mr. D. H. S. Cranage, M.A., F.S.A., on "A Mediæval Abbey." 7.30 p.m.

TUESDAY, FEBRUARY 16.

*Paviors' Company.*—Annual Dinner, Carpenters' Hall 6.30 p.m.

*Royal Victoria Hall, Waterloo-road.*—Mr. P. Gaskell on "Some Old Pictures in the National Gallery." 8.30 p.m.

*Institution of Junior Engineers* (*the Westminster Palace Hotel*).—Lecture II. of Special Course of Six on "Dynamo Design, Construction and Working," by Mr. F. A. Nixon. 8 p.m.

*Institution of Civil Engineers.*—Paper to be further discussed:—"Cold Storage at the London and India Docks," by Mr. H. F. Donaldson. 8 p.m.

WEDNESDAY, FEBRUARY 17.

*Society of Arts.*—Mr. Everard R. Calthrop on "Light Railways." 8 p.m.

*British Archæological Association.*—Miss Edith Bradly on "London Under the Monastic Order." 8 p.m.

*St. Paul's Ecclesiological Society.*—Mr. W. H. St. John Hope, M.A., on "The Plan and Arrangement of a Cistercian Abbey." 7.30 p.m.

*Liverpool Engineering Society.*—Mr. E. W. Pierce on "Principles of the Law of Rating as affecting Engineering Works." 8 p.m.

*Northern Architectural Association.*—Mr. H. Barnes on "Architectural Epidemics." 7.30 p.m.

*Edinburgh Architectural Association.*—Mr. H. F. Kerr on "Elgin Cathedral." Illustrated. 8 p.m.

*Edinburgh Architectural Society.*—Paper by Mr. A. Muirhead. 8 p.m.

THURSDAY, FEBRUARY 18.

*Society of Antiquaries.*—(1) Rev. G. B. Savage on "Ancient Burial Customs." (2) Mr. Grazebrook on "Mediæval Surnames and Their Various Spellings." 8.30 p.m.

*Royal Institution.*—Mr. J. W. Gregory, D.Sc., F.G.S., on "The Problems of Arctic Geology." II. 3 p.m.

*Sanitary Institute* (*Lectures for Sanitary Officers*).—Dr. H. Manley, M.A., on "Sanitary Law: English, Scotch, and Irish; General Enactments Public Health Act, 1875; Model By-laws, &c." 8 p.m.

*Institution of Civil Engineers.*—Students' visit to the Locomotive Works of the Great Eastern Railway Company, Stratford. (Train leaves Liverpool-street at 2.8. p.m.).

*Devon and Exeter Architectural Society* (*Plymouth, &c., Branch*).—Mr. G. H. Fellowes Prynne on "Screens, their Treatment and Symbolism." With lantern illustrations. 7.30 p.m.

FRIDAY, FEBRUARY 19.

*Architectural Association.*—Mr. W. H. Bidlake on "The Architect and the Public." 7.30 p.m.

SATURDAY, FEBRUARY 20.

*Institution of Junior Engineers.*—Visit to the Metropolitan Fire Brigade Headquarters, Southwark Bridge-road, S.E. 3 p.m.

## RECENT PATENTS:

### ABSTRACTS OF SPECIFICATIONS.

470.—FIRE GRATES: *J. D. Hannah and Another.*—In order more effectually to warm rooms by fire grates, inventor provides the back, and preferably also the sides, of grate with an air-chamber, of such shape that the fire in the grate rests against it so as to heat the contained air. At suitable position in such air-chamber one or more radiating pipes are fixed, to allow heated air to escape into room. The supply of air to chamber is meanwhile replenished through opening in lower part of chamber.

2,744.—LOCKS OF WINDOW SASHES: *H. G. Lasenby.*—Invention relates to improvements in the locks of sliding window sashes, more particularly to the kind adapted to be mortised into the pully-styles of window frames, and to engage with the sashes by means of bolts which enter recesses in the style of the sashes. Instead of making the bolt of the lock to operate by means of a motion or protrusion from and reaction into the lock case, and accomplishes the locking of the sashes by means of a rotary motion in a plane parallel to the face of the pulley-style.

2,872.—LADDERS, STEPS, TRESSELS, &C.: *L. Seager.*—In order to render ladders, &c., more convenient, rigid, and safe, inventor connects two or more lengths of steps near the ends by suitable hinges or bolts. On one length of these steps he provides two semicircular metal rings, with indents at convenient angles to admit a bolt or spring catch, &c., and on the other length suitable staples or caps for these rings to pass through, having bolts or spring catches to engage in the indents of the rings.

2,979.—GRATING FOR INTERCEPTING TRAPS: *W. H Reading.*—Invention consists in the adaptation of a spring impelled bolt placed in the recess in the frame part of trap, so as to automatically lock cover when drain is closed. Bolt is unlocked for opening cover by a key.

3,745.—PLUMB-RULES, LEVELS AND CLINOMETERS: *F. R. M. Phelps and Another.* — In order to obtain a means of determining the perpendiculars of a building or structural work, inventors construct an instrument formed of a parallel strip of wood, &c., and cut a plummet line perpendicularly across its centre. At a point on such line they attach a metallic plate having two projecting ends; to the centre of plate is pivotted a metallic pendulum, consisting of a long pointer extending upwards, and a short pendulum rod extending downwards, which is weighted so as to cause the centre of oscillation with the pointer, the ends preventing it oscillating too far either way.

5,110.—CONES FOR WATER-CLOSETS: *S. T. Baster.*—Heretofore water-closet "cones" have been made of sheet-rubber and canvas. In place of this inventor employs a mould of internal shape of the "closet cone," and dips it in a bath of rubber solution till sufficient substance is obtained, strips of canvas are then cemented around this and it is dipped again. Inventor thus obtains a similar article with the canvas embedded in its substance, and, therefore, not liable to split.

5,161.—CHIMNEY-POTS: *T. Smith.*—In order to secure ventilation and obviate down draught, inventor forms in pot (preferably a square one) at two opposite sides and different heights, openings, consisting of a series of vertical slots, this being done in the manufacture. Pivotted buffle-plates are hinged immediately below these openings, such plates being so bent and disposed that the inrush of down currents of air are turned outside by one or other of the plates. From the manner in which plates are hinged they offer no impediment to the brush in sweeping chimney.

# COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

| Nature of Work. | By whom Advertised. | Premiums. | Designs to be delivered. |
|---|---|---|---|
| *Designs for Portions of Hospital | Met. Asylums Board | 150*l.* 100*l.* and 50*l.* prems. | Feb. 22 |
| *New States Assembly Hall, &c Guernsey | The States of Guernsey | 100*l.* and 50*l.* | April 17 |
| *Plans for Club | Nuneaton Conservative Club | 30 guineas | No date |

## CONTRACTS.

| Nature of Work or Materials. | By whom Required. | Forms of Tender, &c. Supplied by | Tenders to be delivered. |
|---|---|---|---|
| *Tar Paving | Woodford U.D.C. | C. Matthew, Council Offices, Woodford | Feb. 15 |
| *Works and Materials | Tottenham U.D.C. | 712, High-rd. Tottenham | Feb. 16 |
| *Making-up Roads | do. | do. | do. |
| *Drain Pipes, also Disinfectants | Camberwell Vestry | O. S. Brown, Vestry Hall | do. |
| Additions to Castle Inn, Pontypridd | Rhondda Valley Breweries Co. Lim. | F. Gibson, Archt. Pontypridd | do. |
| *Works and Materials | Hampstead Vestry | The Surveyor, Vestry Hall | Feb. 17 |
| Fifty Cottages, Miskin, Mountain Ash, Glam. | Miskin Building Club | T. Richards, 1, Foundry-terrace, Mountain Ash | do. |
| Road Metal, Glasgow | Renfrew C.C. | J. Lang, Road Surv. Giffnock, Glasgow | do. |
| Two Pairs Semi-detached Cottages, Stratton, Dorset | A. Pope | A. L. T. Tilley, Archt. 16, Cornhill, Dorchester | do. |
| Two Hundred Houses, Shirebrook, near Mansfield | ..... | Sec. Shirebrook Colliery, Lim. Mansfield | do. |
| Two Houses, Warwich-road, Carlisle | ..... | W. Batey, Crescent Joinery Works, Carlisle | do. |
| *Stabling (in timber), Swansea | M. R. Co. | Co.'s Archt. Cavendish House, Derby | Feb. 18 |
| *Ten Cottages at Mill Hill and Elstree | do. | do. | do. |
| Rebuilding Club, Edlestone-road | Crewe Liberal Unionist Club | J. F. Marsden, 139, Walthall-street | do. |
| Warehouses, Strawberry-place, Newcastle-on-Tyne | Household Furnishing Co. Lim. | Sec. Strawberry-place, Newcastle-on-Tyne | Feb. 19 |
| Fire Engine Station | Paisley Commrs. | T. Walker, Municipal-buildings, Paisley | do. |
| Labourers' Cottages | Celbridge (Ireland) Union | S. Manning, Guardians Offices | do. |
| Six Cottages, Needham-road, Combs, Suffolk | ..... | H. G. Bishop, Archt. Market-place, Stowmarket | do. |
| Additions, &c. Albert Institute, Windsor | ..... | Sec. The Institute, Windsor | Feb. 20 |
| Cottages, North Petherwin, Devon | Duke of Bedford | Steward, Bedford Office, Tavistock | do. |
| *Road Materials and Articles | Newington Vestry | L. J. Dunham, Vestry Hall, Walworth, S.E. | Feb. 22 |
| Road Materials | East Retford R.D.C. | T. Henry, Surv. Retford | do. |
| Pipe Sewers, Aughton | Ormskirk R.D.C. | C. S. Beeston, Engr. Albany buildings, Ormskirk | do. |
| Restoration of Parish Church, Falmouth | ..... | E. Sedding, Archt. Plymouth | do. |
| *External Painting of County Asylum | Hants County Asylum Visitors | Clerk to the Visitors | do. |
| *School Buildings | Walthamstow Sch. Bd. | W. A. Longmore, 7, Gt. Alie-st. Whitechapel, E. | Feb. 23 |
| Sewerage Works | New Mills (Derby) U.D.C. | Spinks & Beever, Engr. 9, Albert-sq. Manchester | do. |
| *Laying, &c. Iron Mains | Southampton Corp. | W. W. Matthews, Town Hall | do. |
| *Making-up, Paving, &c. part of Stonden Park | Lewisham Bd. of Wks. | Surv. Bd. of Wks. Offices, Catford, S.E. | do. |
| *Making-up, Paving, &c. part of Honor Oak Park | do. | do. | do. |
| *Sanitary Work | Whitechapel Union | B. J. Capell, 70, Whitechapel-road, E. | do. |
| *Alterations Boiler House, Removal of boiler, and Supplying Two Steam Cornish Boilers | Woolwich Union | J. O. Cook, 1, Eleanor-road, Woolwich | Feb. 24 |
| Welsh Macadam, &c. | Litherland (Lancs) U.D.C. | W. B. Garton, Surv. 25, Sefton-road, Litherland | do. |
| Sewerage Works | Clayton (Yorks) U.D.C. | J. Waugh, C.E. Sunbridge-chambers, Bradford | do. |
| Sanatorium Works | St. Helens (Lancs) Corp. | G. J. C. Broome, C.E. Boro' Engr. | do. |

## CONTRACTS—*Continued.*

| Nature of Work or Materials. | By whom Required. | Forms of Tender, &c. Supplied by | Tenders to be delivered. |
|---|---|---|---|
| Swimming Bath | Rotherham Corp. | H. H. Hickmott, Council Hall | Feb. 24 |
| *Works and Materials | Wood Green U.D.C. | C. J. Gunyon, Town Hall, Wood Green, N. | Feb. 25 |
| Additions, &c. to Asylum, Mickleover | Derby Visiting Com. | J. S. Story, County Surv. Derby | Feb. 26 |
| *Boiler House, Floors, and Machinery Foundations, &c. | Walthamstow U.D.C. | G. W. Holmes, Town Hall | do. |
| *Retort House, Coal Stores, &c. | Sheffield United Gas Light Co. | Fletcher W. Stevenson, Offices, Commercial-st. Sheffield | Feb. 27 |
| *Stone Paving | Borough of Stamford U.S.A. | J. Richardson, Boro' Surv. Stamford | do. |
| *Constructing Stone Culvert, &c. | Bideford Corp. | Baldwin Latham, 13, Victoria-street, S.W. | do. |
| Three Houses, Albert Royds-street, Rochdale | ..... | Bamford & Brocklebank, Surv. 58a, Yorkshire-st. | do. |
| Additions to Court House, Londonderry | ..... | A. C. Adair, Archt. Londonderry | Mar. 1 |
| *Services and Materials | Hendon U.D.C. | S. S. Grimley, Public Offices, The Burroughs, Hendon, N.W. | do. |
| *Public Library and Institute | Canterbury Corp. | A. H Campbell, 28, St. Margaret's-st. Canterbury | do. |
| *Works and Materials | Hornsey U.D.C. | E. J. Lovegrove, Offices, Southwood-lane, Highgate | do. |
| Pavilion, Cattle Market, Newport, Mon. | Royal National Eisteddfod | B. Lawrence, Archt. Newport | do. |
| *Services and Materials | Beckenham U.D.C. | J. A. Angell, Council Offices | do. |
| *Foundations, County Lunatic Asylum, Horton | London County Council Asylum Committee | G. T. Hine, Archt. 35, Parliament-street, S.W. | do. |
| *Jobbing Works, &c. | Paddington Vestry | The Surv. Vestry Hall | do. |
| *Works, Materials, and Services | Lambeth Vestry | J. P. Norrington, Vestry Hall, Kennington Green | Mar. 2 |
| Work and Materials | Bath U.S.A. | City Surv. Guildhall | do. |
| Almshouses | Bellamy's Charity Trustees | J. E. Knight, Moorgate-street, Rotherham | do. |
| *Sewage Disposal Works | Uckfield U.D.C. | G. Maxwell Lawford, 13, Victoria-street, S.W. | Mar. 3 |
| *Making up Road | Kingston-on-Thames Corp. | Boro' Surv. Clattern House, Kingston | do. |
| *Construction of Winter Garden on Pier | Southend-on-Sea Corp. | Thompson & Greenhalgh, Bank-chmbrs, Southend | do. |
| *Carting | Middlesex C.C. | County Surv. Guildhall, Westminster | do. |
| *Guernsey Granite | do. | do. | do. |
| *Making up Roads | Wanstead U.D.C. | Surveyor's Dept. Council Offices | Mar. 5 |
| *Services and Materials | Bermondsey Vestry | The Clerk, Vestry Hall | Mar. 6 |
| Alterations to Workhouse, Park-road | Gosport Union | H. A. F. Smith, Archt. High-street, Gosport | Mar. 10 |
| *Works, Repairs, and Materials, Liverpool | War Dept. N.W. District | R.E. Office, Rupert-lane, Liverpool | Mar. 15 |
| Additions to Stores, Wincobank, Sheffield | Brightside, &c. Co-op. Soc. Ltd. | H. Webster, Archr. 86, Queen-street, Sheffield | No date |
| Seven Houses, Whitehouse-road, Sheffield | ..... | W. J. Taylor, Archt. 88, Bank-street, Sheffield | do. |
| Residence and Stables, Fairwater, Cardiff | ..... | E. T. Jones, Archt. Cardiff | do. |
| Villas, Creffield-road, Colchester | ..... | J. W. Start, Archt. Colchester | do. |
| Cottages, Bagshot Lea, Farnham | ..... | Nash & Son, Archt. Farnham | do. |
| *Repairs and Materials (triennial contracts) | War Department | Commanding R.E. War Office, Pall Mall, S.W. | do. |

## PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Advertised. | Salary. | Applications to be in. |
|---|---|---|---|
| *Building Inspector | Tottenham U.D.C. | 150*l.* per annum | Feb. 16 |
| *Clerk of Works | Newhaven Union | ..... | do. |
| *Clerk to the Council | Llanelly U.D.C. | 500*l.* per annum | Feb. 20 |
| *Sanitary Inspector | Hampstead Vestry | 110*l.* rising to 140*l.* | Mar. 1 |

*Those marked with an asterisk (*) are advertised in this Number.* *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. ix. & x. *Public Appointments, pp.* xviii. & xxi.

### NEW APPLICATIONS FOR LETTERS PATENT.

JANUARY 25.—1,915, H. Waddington, Water-closet Seats. — 1,926, H. Ilmer, Door Hinges. — 1,933, H. Hastings, Gas Fittings. — 1,971, E. Gulliford, Shop Window Fittings.

JANUARY 26.—2,021, A. Barker, Locks for Sliding Doors and Windows.—2,047, W. Beielstein, Flushing Apparatus with Movable Siphon for Water-closets.—2,052, A Thompson, Window Sash Fasteners.—2,057, J. Buzzard, Repairing Asphalt Pavements.—2,064, W. Smith and J. Isgrig, Sash Locks.—2,092, A. Adams, Locks and Bolts for Doors, &c.—2,118, J. Hannah and W. Peele, Fire Grates, Stoves, &c.

JANUARY 27.—2,164, W. Drummond, Chimney Pot.—2,200, G. Jennings and others, Lavatory Baths and other Valves. — 2,222, A. Wakefield, Earthenware Sanitary Pipes, &c.

JANUARY 28.—2,244, Sir John Smith, Firegrates.—2,257, W. Bray, Chimney Tops, Ventilating Cowls, &c.—2,302, W. Hewitt, Apparatus for the Manufacture of Tiles. 2,304, J. McDougall, Window Sash Fastener.

JANUARY 29.—2,387, C. James, Cast-Iron Hinges.—2,415, J. Ottens and G. Elsenbusch, Chimney Tops.—2,425, W. Vickery, Mitre Cramp.—2,426, R. Grimmer, Fastenings for Doors, Windows, &c.

JANUARY 30.—2,510, E. Lightowler, Ventilators.—2,517, F. Bool, Facilitating the Correct Laying of Sewer and Drain Pipes. — 2,550, J. Robertson, Dove-tailed Wooden Structures, &c.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

19,838, W. Hearn, Discharging Water from a Cistern.—21,390, L. Higginson and J. Walker, Floor Cramps.—23,203, R. Ovens and Others, Automatically Flushing Water Closets.—24,314, L. Ormond, Ventilating Green Houses, Iron and Wood Chapels, Store Rooms, &c.—25,521, R. Birtley, Detachable Cover Joint for Sanitary Pipes, Junctions, Traps, &c.—28,444, W. Plested, Securing Mitred Angles in Woodwork.—28,445, W. Dewar, Doors.—28,920, E. Royston, Tiles, Slabs, &c.—20,012, H. Sutcliffe, Lavatory or Cabinet Stand Wash Basins.—17, J. Goodwin, Cowl or Chimney-pot for Preventing Down Draught in, and Rain from, descending Chimney Flues.—22. R. Wood and S. Richards, Draught and Dust Excluder.—50, D. Buchan, Drain Traps.—58, T. Partridge and E. Abbott, Device for Drain Wells, leading to Sewers, &c., and Disinfecting same.—59, J. Kirkbride, Preventing Window-Sashes from Rattling.—68, B. Gypson, Skylight Frames, &c.—75, W. Norris, Chimney Tops.—83, C. Cockson, Doors, Windows, &c.—93, W. Coats, Chimney Cowls.—97, G. Bray, Gas Lights.—222, W. Starley, Nails.—224, J. Brindley, Machinery for Making Ceramic Tiles.—229, T. Kemp, Inspection and Sweeping Inlets to Drain Pipes, Bends, and Junctions.—258, H. Hawgood, Sash Fasteners. — 528, J. Shanks, Water Closets.—743, G. Chisholm, junior, Lavatory Basins.—802, J. Verdin, Door Handles.—983, N. Lynn, Heads or Cowls for Chimneys, Ventilating Shafts, &c.—1,220, W. Peel, Chimney Cowls or Pots.—1,299, C. Erlinghagen, Sheet-iron Corrugated Roofings.—1,345, J. Thomason and Others, Dies for Brick-making Machines.—1,414, J. Richardson, Moulds for Brick-making Machinery.

### COMPLETE SPECIFICATIONS ACCEPTED.

*Open to opposition for two months.*

3,364, W. McCormick, Syphons.—4,894, J. Jobbins, Starting of Syphons of Flushing Tanks.—5,549, E. Codling, Intercepting Traps for Drains and Sewers.—18,714, H. Boult, Artificial Stone.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

January 19.—By DRIVER & Co. (at Welling).

| | |
|---|---|
| Welling, Kent.—A Freehold Building Estate, containing 4a. 3r. 25p. | £1,665 |

January 20.—By FOSTER & CRANFIELD.

| | |
|---|---|
| Stratford.—Abbey-lane, a profit rental of 55*l.* for 7¾ yrs. | 180 |

By OSBORN & MERCER (at Braintree).

| | |
|---|---|
| Wethersfield, Essex.—"Russells Farm, 115 a. (including timber) | 1,234 |
| "School Green" Farm, 36 a., f. (including timber) | 521 |

By WARNER, SHEPPARD, & WADE (at Leicester).

| | |
|---|---|
| Leicester.—Humberston Gate, "The Bell Hotel," 1,359 yds., f. | 16,000 |

By BAILEY & SON (at Newark).

| | |
|---|---|
| Newark, Notts.—23, Castlegate, f. | 1,500 |
| North Collingham, Notts.—Enclosures of land, 22 a. 0 r. 37 p., f. | 1,045 |
| Sutton-on-Trent, Notts.—Enclosures of land, 65 a. 3 r. 38 p., f. | 2,046 |

January 21.—By DUNCAN & KIMPTON.

| | |
|---|---|
| Shepherd's Bush.—26, 28, and 29, Providence-pl., u.t. 12½ yrs., g.r. 12*l.* 12s. | 210 |

By M. LONG (at Norwood).

| | |
|---|---|
| Norwood.—24, 26, 28, 30, and 34, Eagle Hill, f., r. 88*l.* 8s. | 860 |

By ABERCROMBIE & EDMUNDS.

| | |
|---|---|
| Willesden.—1 to 6, Cooper-rd., f., r. 132*l.* 12s. | £1,060 |

By JOHN SMITH (at Whitehaven).

| | |
|---|---|
| Ennerdale, &c., Cumberland. — "Bankhouse" farm and 46 a., f. | 1,070 |

January 22.—By P. W. TALBOT & Co.

| | |
|---|---|
| Marylebone.—20, Carburton-st., u.t. 33 yrs., g.r. 16*l.*, e.r. 60*l.* | 410 |
| Kentish Town.—51, Hawley-rd., u.t. 34 yrs., g.r. 6*l.* 6s., r. 40*l.* | 275 |

By Messrs. SPELMAN (at Norwich).

| | |
|---|---|
| Catton, Norfolk.—1 to 6, Grove-ter., f., r. 50*l.* 14s. | 560 |

By WYATT & SON (at Chichester).

| | |
|---|---|
| Chichester, Sussex.—Clay-lane, a freehold house and 1 a. 0 r. 5 p. | 460 |

By G. J. ROBINSON (at Barnard Castle).

| | |
|---|---|
| Bowes, Yorks. — "Sleightholme and Bargap Farms," 323 a. 3 r. 34 p., f.; also moiety of 130 a. 2 r. 10 p. | 8,050 |

January 23.—By SEXTON & GRIMWADE (at Colchester).

| | |
|---|---|
| Fordham, Essex.—"Fletcher's and Idle's Farms," f. and c. | 775 |
| Three enclosures of land, 18 a. 0 r. 5 p., c. | 180 |
| Five enclosures of land, 31 a. 1 r. 18 p., f. | 265 |

January 26.—By W. W. READ & Co.

| | |
|---|---|
| Old Kent-rd.—91 and 93, Trafalgar-rd., u.t. 12¾ yrs., g.r. 7*l.* 14s. | 155 |
| 12, 14, 16 and 18, Jardin-st., u.t. 24 yrs., g.r. 13*l.* 13s. | 520 |
| Barnes.—71, White Hart-lane, u.t. 84¾ yrs., g.r. 7*l.*, r. 45*l.* | 460 |

By RUTLEY, SON, & VINE.

| | |
|---|---|
| Hackney.—Clapton-sq., f.g.r. 65*l.*, reversion in 99 yrs. | 1,980 |
| Holloway.—75, Sussex-rd., u.t. 54¾ yrs., g.r. 6*l.* 6s., r. 34*l.* | 325 |

By C. W. DAVIES.

| | |
|---|---|
| Canonbury.—4, Alwyne-sq., u.t. 39½ yrs., g.r. 14*l.* e.r. 65*l.* | 400 |
| Hoxton.—28, 29 and 30, Murray-st., u.t. 45½ yrs., g.r. 16*l.* 10s. | 840 |
| Caledonian-rd.—47, Bingfield-st., u.t. 44 yrs., g.r. 18*l.*, r. 38*l.* | 150 |

*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent yd. for yard &c.

## PRICES CURRENT OF MATERIALS.

| TIMBER. | | |
|---|---|---|
| Greenheart, B.G. | ton | £ s. d. 8/0/0 0/0/0 |
| Teak, E.I. | load | 11/0/0 16/0/0 |
| Sequoia, U.S.ft.cu. | | 1 9 2/0 |
| Ash, Canada load | | 3/15/0 4/0/0 |
| Birch, do. | | 3/15/0 5/10/0 |
| Elm, do. | | 3/10/0 4/15/0 |
| Fir, Dantsic, &c. | | 2/15/0 4/15/0 |
| Oak, do. | | 3/10/0 3/15/0 |
| Canada | | 5/0/0 6/0/0 |
| Pine, Canada red | | 0/0/0 0/0/0 |
| Do. Yellow | | 2/5/0 4/5/0 |
| Lath, Dantsic, fath | | 4/10/0 5/10/0 |
| St. Petersburg | | 5/0/0 6/10/0 |
| Wainscot, Riga, &c., log | | 2/10/0 4/15/0 |
| Odessa, crown | | 2/10/0 4/15/0 |
| Deals, Finland | | |
| 2nd & 1st std | 100 | 9/0/0 9/10/0 |
| Do. 4th & 3rd | | 9/0/0 9/10/0 |
| Do. Riga | | 7/10/0 8/10/0 |
| St. Petersburg, 1st yellow | | 11/0/0 13/10/0 |
| Do. 2nd yellow | | 10/0/0 11/0/0 |
| Do. white | | 9/10/0 11/10/0 |
| Swedish | | 9/0/0 16/10/0 |
| White Sea | | 10/10/0 17/0/0 |
| Canada, Pine 1st | | 20/0/0 23/0/0 |
| Do. do. 2nd | | 14/10/0 16/0/0 |
| Do. do. 3rd, &c. | | 7/0/0 10/10/0 |
| Do. Spruce, 1st. | | 9/10/0 11/10/0 |
| Do. do. 3rd and 2nd | | 7/15/0 9/0/0 |
| New Brunswick | | 7/0/0 10/10/0 |
| Battens, all kinds | | 5/0/0 10/0/0 |
| Flooring boards, sq., 1 in. prep. 1st | | 0/9/0 0/16/0 |
| Do. 2nd | | 0/7/6 0/12 6 |
| Other qualities— | | 0/5 9 0/7/0 |
| Cedar, Cuba, ft. | | 1/4 1/5 |
| Honduras, &c. | | 1/4 1/5 |
| Mahogany, Cuba | | 1/4 1/6 |
| St. Domingo, cargo av. | | 1/4 1/3 |
| Mexican, do. do. | | 1/4 1/5 |
| Tobasco, do. do. | | 1/5 1/7 |
| Honduras, do. | | 1/5 1/6½ |
| Box, Turkey, ton | | 4/0/0 15/0/0 |
| Rose, Rio | | 7/0/0 16/0/0 |
| Bahia | | 6/0/0 15/0/0 |
| Satin, St. Doming. | | 0/0/7 0'1/0 |

| TIMBER *(continued)*. | | |
|---|---|---|
| Satin, Porto Rico | 0/0/7 | 0/1/6 |
| Walnut, Italian | 0/0/3 | 0/0/7 |
| **METALS.** | | |
| Iron—Pig, in Scotland ton | 2/7/5 | 0/0/0 |
| Bar, Welsh, in London | 5/15/0 | 5/17/6 |
| Do. do. at works in Wales | 5/10/0 | 5/12/6 |
| Do. Staffordshire, in London | 5/15/0 | 6/10/0 |
| COPPER—British cake and ingot | 54/10/0 | 55/0/0 |
| Best selected | 55/5/0 | 55/15/0 |
| Sheets, strong | 6./10/0 | 61/10/0 |
| Chili bars | 51/7/6 | 0/0/0 |
| YELLOW MTL lb. | 0/0/5 | 0/0/5½ |
| LEAD—Pig, Spanish ton | 11/13/9 | 11/15/0 |
| English com. brands | 11/16/3 | 11/18/9 |
| Sheet, English 6 lbs. per sq. ft. and upwards | 13/0/0 | 0/0/0 |
| Pipe | 13/10/0 | 0/0/0 |
| ZINC—English sheet ton | 20/10/0 | 0/0/0 |
| Vieille Montagne | 21/10/0 | 0/0/0 |
| Spelter | 17/17/6 | 0/0/0 |
| TIN—Straits | 61/10/0 | 0/0/0 |
| Australian | 63/0/0 | 63/10/0 |
| English Ingots | 65/0/0 | 66/10/0 |
| Banca | 61/0/0 | 0/0/0 |
| Billiton | 59/15/0 | 60/0/0 |
| **OILS.** | | |
| Linseed ton | 15/10/0 | 0/0/0 |
| Cocoanut, Cochin | 27/15/0 | 0/0/0 |
| Do. Ceylon | 24/0/0 | 0/0/0 |
| Palm, Lagos | 24/10/0 | 0/0/0 |
| Rapeseed, English pale | 27/10/0 | 27/15/0 |
| Do. Brown | 27/0/0 | 27/10/0 |
| Cottonseed ref. | 15/17/6 | 16/10/0 |
| Oleine | 18/10/0 | 19/10/0 |
| Lubricating U.S. | 0/6/3 | 0/7/6 |
| Do. black | 0/4/9 | 0/6/6 |
| TAR—Stockholm barrel | 22/0 | 0/0/0 |
| Archangel | 0/12/6 | 0/0/0 |
| Turpentine ton | 22/12/6 | 0/0/0 |

## TENDERS.

[Communications for insertion under this Heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender: and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

AYR (N.B.).—For the construction of 6¼ miles of sewers, &c., for the Commissioners. Mr. J. Eaglesham, C.E, Town Chambers, Ayr:—

| | | | |
|---|---|---|---|
| W. G. Flett | £10,000 0 0 | Brannigan & Scott | £5,238 4 1 |
| Shanks & McEwan | 9,531 13 7 | James Osborne | 5,200 16 3 |
| A. Waddell & Son | 8,341 12 2 | Robt. Stevenson | 5,144 18 0 |
| Workman & Co. | 7,517 8 2 | Wm. Simpson | 4,990 10 10 |
| L. & W. McDonald | 5,555 3 3 | Thos. Crawford & Son | 4,832 11 3 |
| Craik & Hendry | 5,539 19 1 | W. H. Blackburn | 4,701 19 11 |
| John Paterson & Sons | 5,358 9 3 | Chas. McAndrew | 4,541 18 7 |
| James Miller | 5,305 2 6 | Hugh Hastie, Crieff* | 4,257 8 0 |

* Accepted.

BATLEY.—For the erection of boundary walls, Smithies Moor-lane, for the Corporation. Mr. Hy. Dearden, Borough Surveyor, Town Hall, Batley. Quantities by Borough Surveyor:—
James Farrar, Brownhill, Birstall ..... £763

BELFAST.—For the execution of road and sewage works, Hampton Park Estate, for Mr. Isaac Hampton. Messrs. Forman & Aston, C.E., 15A, Donegall-place, Belfast:—

| | | | |
|---|---|---|---|
| David Ireland | £1,000 0 0 | Jas. Ross & Son | 630 0 0 |
| Workman & Co. | 820 13 6 | William McLarnon | 619 10 0 |
| J. & R. Thompson | 801 1 3 | Michael Green, 135, Donegall-street, Belfast* | 581 2 5 |
| John Graham, Jun. | 773 18 7 | | |
| Wm. Geddis | 752 10 0 | | |
| Thos. McMurray | 708 0 0 | | |

* Accepted.

BRADFORD.—Accepted for the erection of stables and coach-house, Morley-street, for Messrs. Empsall & Clarkson, architects, 7, Exchange, Bradford:—
*Masonry and Joinery.*—John Moulson & Son
*Plumbing.*—Robt. Townend
*Plastering.*—T. Cordingley & Son
*Slating.*—Jas. Smithies
*Painting.*—John Looras
} £756
[All of Bradford.]

BURSLEM (Staffs).—For laying pipe sewer, &c., Moorland-road, for the Corporation. Mr. F. Bettany, Borough Surveyor, St. John's Chambers, Queen-street, Burslem:—

| | | | |
|---|---|---|---|
| J. Horobin | £355 | J. Buck | £315 |
| F. Barke | 347 | Smith & Taylor | 298 |
| J. Embury | 346 | W. & R. Mellor, Burslem* | 285 |
| Wilton | 320 | | |

*Accepted.

CHRISTCHURCH (Hants).—For alterations, &c., at workhouse, Fairmile. Mr. Edgar H. Burton, architect, Branksom Park, Bournemouth:—

| | | | |
|---|---|---|---|
| W. H. Wilson | £1,010 4 | Tom Tiller, Bargates, Christchurch* | £582 0 |
| Jenkins & Sons | 609 0 | | |

* Accepted.

DALHOUSIE (N.B.).—Accepted for extending Newton-Loan Hospital. Mr. Jas. Jerdan, architect, 12, Castle-street, Edinburgh:—

| | |
|---|---|
| *Bricklaying.*—Thomas Cumpstie, Dalkeith | £239 10 6 |
| *Carpentry and Joinery.*—Thomas Macfarlane, Govebridge | 185 0 0 |
| *Slating.*—John Clapperton & Sons, Govebridge | 38 8 6 |
| *Plastering.*—William Stewart, Edinburgh | 47 0 0 |
| *Plumbing.*—Alex. Hart, Dalkeith | 53 8 6 |
| *Window Blinds.*—William Bryden & Son, Edinburgh | 9 12 0 |

DEVONPORT.—For new shop fronts and structural alterations at No. 19, Marlborough-street, for Messrs. Pote & Son. Mr. H. G. Luff, architect, Devonport:—
Turpin ..... £348 10
T. Jenkin & Son, Devonport (accepted) ..... 338 0

DEVONPORT.—Accepted for new shop fronts, Marlborough-street, for Mr. C. E. Waycott. Mr. H. G. Luff, architect:—
W. J. Oliver ..... £131 15

DOVER.—For a pair of semi-detached villa residences, Barton-road, Dover. Messrs. Worsfold & Hayward, architects, Dover:—

| | | | |
|---|---|---|---|
| Hayward & Paramor | £1,377 | Austin & Lewis | £1,180 |
| Wm. Dixon | 1,363 | J. Parsons (accepted) | 1,116 |

GREAT YARMOUTH.—For additions, &c., to the "Queen's Hotel," for Mr. J. W. Nightingale. Mr. A. J. Lacey, architect, 6, Upper King-street, Norwich:—

| | | | |
|---|---|---|---|
| S. Chapman & Son | £899 | G. W. Beech | £824 |
| J. Downing & Sons | 898 | W. Cork, Great Yarmouth* | 733 |
| Carter & Wright | 840 | | |

*Accepted.

HASTINGS.—Accepted for additions, &c., to engine and boiler house, Waterworks-road, for the Corporation. Mr. P. H. Palmer, C.E., Borough Engineer, Town Hall, Hastings:—
H. Ditch, High-street, Hastings ..... £653

HERTFORD.—For the supply of 600 tons broken granite road metal for the Corporation. Mr. J. H. Jevons, Borough Engineer, Town Hall, Hertford:—

| | Per ton. s. d. |
|---|---|
| Fennings | 15 9 |
| W. Griffiths | 15 4 |
| Croft Granite Co. | 10 10 |
| Van Praagh & Co. | 11 6 |
| Yarborough Granite Co. | 10 6 |
| Clee Hill Granite Co., Ludlow | 15 1 |
| Somerfield, Burnshire | 10 9 |
| Midland Quarry Co., Nuneaton* | 10 3 |
| H. N. Foy, " | 10 3 |
| Forest Rock Co., Leicester | 10 9 |
| Fergusson & Co., Enderby | 11 4 |
| Ellis & Everard, Bardon Hill | 12 0 |
| Swift Granite Co., Nuneaton | 10 6 |
| Gownley & Son, Cliffe Hill | 11 3 |
| " , Enderby | 11 0 |
| Enderby & Stoney Stanton | 11 0 |
| Mount Sorrell Co.,* Stoney Stanton Granite | 10 3 |

* Accepted for such quantity as may be ordered.

LEEDS.—Accepted for the construction of a covered reservoir, &c., for the Corporation. Mr. Thomas Hewson, City Engineer, Leeds:—
Harold Arnold & Son, Doncaster ..... £23,920

LANGHOLME.—Accepted for the supply and erection of laundry machinery, drying closets, lift, &c., at the new Hospital, Langholme, Dumfries, for the Managers. Messrs. Ainsley & Wood, architects, London. Mr. J. Kirkland, C.E., Engineer, Westminster:—
Harper Twelvetrees, Ltd., Southwark-street, London £362

LLANDILO.—For building a residence for Mr. R. Shipley Lewis. Mr. David Jenkins, architect:—

| | | | |
|---|---|---|---|
| Lewis Davies | £1,280 | Thomas Bros., Llandilo* | £1,200 |
| G. Mainwaring | 1 250 | Henry Price | 1,150 |
| David Evans | 1,200 | | |

* Accepted.

LLANDILO.—For building a post-office. Mr. David Jenkins, architect:—

| | | | |
|---|---|---|---|
| G. Mainwaring | £1,010 0 | Thomas Bros. | £825 0 |
| Lewis Davies | 1,002 0 | Henry Price | 783 0 |
| J. & D. Jones | 935 0 | David Evans, Llandilo* | 779 10 |

* Accepted.

LLANDILO.—Accepted for building a pair of semi-detached villa residences, for Mr. William Jones Canton. Mr. David Jenkins, architect:—
Thomas Bros., Llandilo ..... £600

LLANCONEN (Cardiganshire).—Accepted for building a farm stead for Mr. Yeters Evans. Mr. David Jenkins, Llandilo' architect:—
David Evans, Llwynleedes, Llanyleyther, R.S.O. .... £780

LOSTWITHIEL (Cornwall).—Accepted for the erection of four dwelling houses, for Messrs. Liddicoat. Mr. Wm. J. Jenkins, architect, Bodmin:—
Bassett Bros., Lostwithiel ..... £2,697

LONDON.—For furniture at the Dudding Hill School, for the Willesden School Board. Mr. G. E. T. Laurence, architect, 181, Queen Victoria-street, E.C.:—

| | | | |
|---|---|---|---|
| Illingworth, Ingram, & Co. | £849 16 5 | The Bennett Furnishing Co., Glasgow* | £804 5 10 |

* Accepted.

LONDON.—For furniture at the Leopold-road School, for the Willesden School Board. Mr. G. E. T. Laurence, architect, 181, Queen Victoria-street, E.C.:—

| | | | |
|---|---|---|---|
| Illingworth, Ingram, & Co. | £988 11 5 | The Bennett Furnishing Co., Glasgow* | £940 15 10 |

* Accepted.

LONDON.—For erecting the Kensal Green School for 1,270 children, laundry and cookery centre, and caretaker's house, for the Willesden School Board. Mr. G. E. T. Laurence, architect, 181, Queen Victoria-street, E.C. Quantities by Mr. Alan Paull, 6, Quality-court, Chancery-lane, W.C.:—

| | | Alternative Extra glazed Bricks. |
|---|---|---|
| Holloway Bros. | £22,790 | £950 |
| H. Wall & Co. | 20 599 | 910 |
| G. Godson & Sons | 19,618 | 870 |
| Cowley & Drake | 18,250 | 665 |
| W. Scrivener & Co. | 18,236 | 725 |
| J. Chessum & Sons | 17,999 | 947 |
| Smith & Sons | 17,989 | 936 |
| E. Lawrance & Sons | 17,712 | 688 |
| R. A. Yerbury & Sons* | 17,309 | 520 |

*Accepted subject to Education Department's approval.

LONDON.—Accepted for road-making and paving-works, Hythe-road (Section 1), for the Hammersmith Vestry. Mr. H. Mair, C.E., Vestry Hall, Hammersmith, W.:—
Wimpey & Co., Hammersmith ..... £1590

LONDON.—For building a villa residence in Balmoral-road, New Brompton, for Mr. F. Pierson. Mr. E. J. Hammond, architect, New Brompton:—

| | | | |
|---|---|---|---|
| J. H. Park | £507 0 | F. A. Hammond | £375 10 |
| J. L. Truman | 463 0 | C. E. Skinner, Chatham* | 335 0 |
| H. Harris | 395 0 | | |

* Accepted.

LONDON.—For alterations to shop and premises, for Messrs. Beckett & Tavener, 169, King-street, Hammersmith. Mr. J. Hume, architect:—

| | | | |
|---|---|---|---|
| Clifton | £320 | Pope & Co. | £265 |
| Bendon | 278 | J. Leeder & Co., Chiswick* | 245 |

* Accepted.

LONDON.—For the erection of a new Police Station at Camberwell, for the Receiver for the Metropolitan Police District. Mr. J. Dixon Butler, Architect. Quantities by Mr. W. H. Thurgood:—

| | | | |
|---|---|---|---|
| Yerbury | £11,935 | Scrivener | £11,235 |
| Hart | 11,685 | Grover | 11,220 |
| Chessum | 11,400 | Holloway | 11,000 |
| Lawrance | 11,385 | Higgs & Hill | 10,984 |
| Ansell | 11,275 | Lathey | 10,970 |
| Perry | 11,270 | Lascelles | 10,670 |

LONDON.—For the erection of new show-room, for Messrs. Peter & Evans, 464, Brixton-road. Mr. W. M. Brutton, architect:—

| | | | |
|---|---|---|---|
| W. Rowe | £1,498 | Tyerman | £1,416 |
| Haydon | 1,481 | Godson & Sons | 1,420 |
| Triggs | 1,450 | Peacock Bros. | 1,385 |
| Courtney & Fairburn | 1,425 | Edwards & Medway | 1,320 |

LONDON.—For rebuilding shop, High-road, Streatham, for Messrs. Purchase & Perham. Messrs. Saville & Martin, architects:—

| | | | |
|---|---|---|---|
| Gough & Co. | £2,654 | Peacock Bros. | £2,509 |
| Godson & Son | 2,596 | Burman & Son | 2,520 |
| Mitchell, S. E. | 2,563 | Palmer, W. D. | 2,490 |

LONDON.—For repairs to the s.s. *Bazalgette*, for the London County Council:—

| | | | |
|---|---|---|---|
| Robert Amor & Co. | £695 0 | Mills & Knight | £298 12 |
| John Stewart & Son, Ltd. | 486 11 | Fletcher, Son, & Fearnall, Ltd.* | 239 10 |
| Robinson & Dodd | 3:4 10 | | |

* Accepted.

LONDON.—Accepted for the execution of certain specified work of painting and repair to the watchboxes, fencing, &c., at Clapham Common, Wandsworth Common, Blackheath and Maryon Park, for the London County Council:—

*Clapham Common.*
R. Harding & Son ..... £148 19 3

*Wandsworth Common.*
G. McArthur ..... £81 19 11

*Blackheath.*
E. Sroctor ..... £266 16 1

*Maryon Park.*
E. Proctor ..... £78 18 8

LONDON.—For repair of roads and paths in parks, for the London County Council:—

| *Brockwell Park.* | Gravel, per cubic yard. s. d. | Hoggin, per cubic yard. s. d. |
|---|---|---|
| J. Smith & Sons | 9 3 | — |
| H. Lake | 7 0 | 8 0 |
| J. E. Woodhams | 7 3 | 7 9 |
| Potter & Co. | 7 0 | 7 6 |
| G. W. Riley | 6 6 | 7 0 |
| W. Langridge* | 5 5 | 6 7 |

| *Dulwich Park.* | Cockle shell, per cubic yard. s. d. |
|---|---|
| L. Somerfeld | 12 0 |
| Fry Brothers* | 9 6 |

| *Dulwich Park.* | Gravel, per cubic yard. s. d. | Hoggin, per cubic yard. s. d. |
|---|---|---|
| W. Langridge* | 5 5 | 6 7 |
| G. W. Riley | 6 9 | 7 3 |
| Potter & Co. | 7 0 | 7 6 |
| H. Lake | 7 0 | 8 0 |
| J. F. Woodhams | 7 3 | 7 9 |
| J. Smith & Sons | 9 3 | — |
| *Peckham Rye Park.* | | |
| W. Langridge* | 5 7 | 6 9 |
| G. W. Riley | 7 0 | 7 0 |
| Potter & Co. | 7 6 | 8 0 |
| H. W. Budd | 7 6 | 8 3 |
| E. Pitches | 8 6 | — |
| J. Smith & Sons | 9 3 | — |

| *Parliament Hill.* | Hoggin, per cubic yard. s. d. |
|---|---|
| R. Ballard, Limited* | 7 0 |
| F. A. Jackson & Son, Limited | 7 6 |
| H. Barnaby | 7 6 |
| *Waterlow Park.* | |
| R. Ballard, Limited* | 6 10 |
| F. A. Jackson & Son, Limited | 7 0 |
| H. Barnaby | 7 0 |

| *Clissold Park.* | Cockle shell, per cubic yard. s. d. | Hoggin, per cubic yard. s. d. |
|---|---|---|
| F. A. Jackson & Son, Limited | 9 6* | 6 6 |
| R. Ballard, Limited | — | 6 8 |
| Fry Brothers | 13 0 | — |

| *Finsbury Park.* | Cockle shell, per cubic yd. s. d. | Hoggin, per cubic yd. s. d. | Gravel, per cubic yd. s. d. |
|---|---|---|---|
| F. A. Jackson & Son, Limited | 9 6 | 5 11* | 7 1* |
| R. Ballard, Limited | — | 6 6 | 7 9 |
| W. J. Lewcock | — | 6 6 | 7 6 |
| L. Sommerfeld | 12 0 | — | — |
| Fry Brothers | 13 0 | — | — |

* Accepted

LONDON.—For alterations to circle, stage, &c., and furnishing, at the London Pavilion, for the London Pavilion, Limited, from plans and specification prepared by Mr. Harry Percival, architect, 22, Buckingham-street, Adelphi, W.C.:—

| | | | |
|---|---|---|---|
| Atkinson & Co. | £324 16 | Bishop & Co. | £373 |
| Campbell Smith & Co.* | 304 0 | | |

* Accepted.

LONDON.—Accepted for the erection of a block of residential mansions in North-street, Belgravia, London, S.W. Mr. E. J. Sadgrove, architect, 22, Surrey-street, Strand, London, W.C. Quantities by Mr. W. H. Elsmore, Castlenan, Barnes, S.W.:—
Stephens, Bastow, & Co., Ltd., Bristol ..... £80,000

MANCHESTER.—Accepted at a schedule of prices for the execution of street works, Northumberland-road, and Darwen-street, for the Stretford District Council. Mr. Royle, Surveyor, District Council Offices, Old Trafford:—

| *Northumberland-road.* | *Darwen-street* |
|---|---|
| M. Naylor & Sons, Hulme. | Wm. Clarke, Hulme. |

MORTLAKE.—For making up road, draining, and new fencing, for Sir Frederick Wynn, at Worple-road, Mortlake. Mr. C. Innes, architect, 27, Queen-street, City:—

| | | | |
|---|---|---|---|
| Blackburn | £710 9 | Sale* | £484 2 |
| Hill | 549 8 | | |

* Accepted.

OUNDLE.—For the erection of a house, out-offices, &c., West-street, for Mrs. Hames. Mr. J. G. Stallebrass, architect, North-street, Peterborough:—

| | | | |
|---|---|---|---|
| Siddons & Freeman | £870 | Nichols | £800 |
| Pettitt, Thrapston (accepted) | 824 | Roberts | 788 |

*Plumbing, &c.*
Coaten, Oundle ..... £100

PAISLEY (N.B.)—Accepted for the erection of public schoo buildings, Carbrook-street, for the School Board of Paisley. Mr. Charles Davidson, architect, Terrace-buildings, Paisley. Quantities by Mr. James Lamb, measurer, Paisley:—

| | | |
|---|---|---|
| *Masonry.*—William Taylor, Paisley | £2,730 0 0 | |
| *Joinery.*—Allan & Baxter, Glasgow | 2,204 5 8 | |
| *Slating.*—A. H. Kilpatrick, Paisley | 210 17 1 | |
| *Plumbing.*—William Glover, Paisley | 291 18 1 | |
| *Gasfitting.*—Wallace, Connell, & Co., Paisley | 157 6 0 | |
| *Plastering.*—William Speirs, Paisley | 459 3 1½ | |
| *Steel and Iron Work.*—P. & W. MacLellan, Glasgow | 206 12 4 | |
| *Tiling.*—Kean & Wardrop, Glasgow | 46 16 0 | |

[The total cost of the school to be £7,520, and the accommodation for 836 scholars.]

PELAW-ON-TYNE.—For erecting the Station Hotel, Pelaw-on-Tyne, for Mr. John G. Joicey. Mr. J. W. Frazer, architect, Newcastle-on-Tyne:—

| | | | |
|---|---|---|---|
| Bradley & Slipper | £3,198 14 2 | J. B. Stott | £2,569 18 0 |
| R. S. Harbottle | 2,633 17 6 | W. H. Brown | 2,479 18 1 |
| Cowper & Henderson | 2,579 5 10 | J. C. Hope | 2,472 0 0 |
| Wakefield & Henderson | 2,523 0 0 | T. & R. Lamb | 2,468 4 3 |
| T. Lumsden | 2,522 0 0 | G. T. Manners | 2 459 0 0 |
| J. White | 2,516 0 0 | J. Henri | 2,416 0 0 |
| | | G. H. Hodgson, Sunderland* | 2,396 0 0 |

* Accepted.

PETERBOROUGH.—For the erection of a steam laundry, exclusive of machinery, for the Park Sanitary Steam Laundry Company. Mr. J. G. Stallebrass, architect, North-street, Peterborough:—

| | | | |
|---|---|---|---|
| R. J. Nichols | £1,700 0 0 | J. Wenlock | £1,450 0 0 |
| Furniss Bros. | 1,680 0 0 | D. Gray | 1,420 0 0 |
| W. Bridgefoot & Son | 1,600 0 0 | W. Jellings | 1,399 19 11 |
| Watson & Lucas | 1,540 0 0 | Hicks Bros.* | 1,370 0 0 |
| W. Rowe | 1,498 7 0 | | |

* Accepted.
[All of Peterborough.]

ROTHERHAM.—For the erection of six houses, Gerard-road. Messrs. Hutchinson & Sons, architects, Howard-street, Rotherham:—

| | |
|---|---|
| *Masonry and Brickwork.*—Wm. Thornton & Son | £730 |
| *Joinery.*—T. W. Outram | 360 |
| *Plastering.*—J. Jenneson | 95 |
| *Plumbing.*—Gibbons | 74 |
| *Painting.*—W. Vickers | 24 |

[All of Rotherham.]

RUGBY.—For the construction of streets, sewers, &c., Lawford Gardens Estate (Contract No. 2). Mr. T. W. Willard, surveyor, Rugby. Quantities by the surveyor:—

| | | | |
|---|---|---|---|
| John Machay | £2,355 18 4 | J. Ford | £1,936 17 3 |
| R. Loch | 2,315 10 0 | W. T. Hall | 1,734 0 0 |
| J. S. Trueman | 2,275 0 0 | J. Young | 1,650 0 0 |
| W. Hitchman | 2,124 2 0 | A. Jewell, Harboro* | 1,525 0 0 |
| F. Bentham | 1,993 0 0 | | |
| J. Porter | 1,989 0 0 | | |

* Accepted.

SUTTON.—For making roads, &c., Mahor House Estate, Sutton Surrey:—

| | | | |
|---|---|---|---|
| W. Gibbs | £5,343 15 2 | A. Bullock | £3,152 11 6 |
| W. Langridge | 3,499 0 0 | W. H. Wheeler | 2,743 0 0 |
| G. Alkins | 3,326 10 0 | W. Jenner, Sutton* | 2,673 16 0 |
| S. Kavanagh | 3,240 0 0 | | |

* Accepted.

TAVISTOCK.—For the erection of a pair of semi-detached villa-residences, for the Tavistock Land and Building Company, Ltd. Mr. Wm. Squire, architect, Tavistock:—

| | | | |
|---|---|---|---|
| Alfred Dennis | £2,000 | A. Andrews | £1,775 |
| E. Luke | 1,835 | H. B. Tuge, Horrabridge* | 1,729 |

* Revised and accepted.

## LONDON SCHOOL BOARD TENDERS.

The following lists of tenders were submitted by the Works Committee of the London School Board at the meeting of the Board on Thursday:—

DEODAR-ROAD (West Lambeth).—Removing three iron buildings and offices from Page's-walk and re-erecting them on this site:—

| | | | |
|---|---|---|---|
| James Mitson | £1,388 9 4 | W. Harbrow | £867 0 0 |
| T. Cruwys | 983 0 0 | Croggon & Co., Ltd.* | 775 0 0 |
| Humphreys, Ltd. | 937 0 0 | | |

* Accepted.

FLEET-ROAD.—Erecting manual training centre, &c.:—

| | | Extra amount required for building brickwork in cement. |
|---|---|---|
| F. G. Minter | £1,340 0 0 | £35 0 0 |
| D. Charteris | 1,315 0 0 | 38 0 0 |
| Perkins & Co. | 1,291 0 0 | 24 0 0 |
| E. Lawrance & Sons | 1,270 0 0 | 32 0 0 |
| McCormick & Sons | 1,256 12 5 | 25 12 0 |
| Lathey Bros. | 1,229 0 0 | 27 0 0 |
| G. Neal | 1,224 6 8 | 28 16 4 |
| Cowley & Drake | 1,206 0 0 | 25 12 0 |
| E. T. Folley* | 1,187 0 0 | 20 0 0 |

* Recommended for acceptance.

MARLBOROUGH-ROAD.—Reconstructing offices and drainage and sanitary work:—

| | | | |
|---|---|---|---|
| Foster & Dicksee | £1,880 | W. Akers & Co. | £1,354 |
| W. Downs | 1,551 | W. Hammond | 1,351 |
| G. Foxley | 1,549 | Lathey Bros. | 1,339 |
| F. G. Minter | 1,497 | E. Triggs | 1,333 |
| T. Cruwys | 1,495 | Stimpson & Co. | 1,330 |
| Lilly & Lilly, Ltd. | 1,487 | R. A. Yerbury & Sons | 1,310 |
| Perkins & Co. | 1,385 | Cowley & Drake* | 1,265 |

* Recommended for acceptance.

SCAWFELL-STREET.—Providing and fixing boiler:—

| | | | |
|---|---|---|---|
| G. Davis | £160 0 | H. C. Price, Lea, & Co. | £79 0 |
| J. C. & J. S. Ellis, Ltd. | 93 10 | Duffield & Co.* | 77 0 |
| J. F. Clarke & Sons | 92 0 | | |

* Accepted.

## TO CORRESPONDENTS.

J. E., Sons, & Co., G. H.P. (amounts should have been stated).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

*We cannot undertake to return rejected communications.*

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

## PUBLISHER'S NOTICES.

*Registered Telegraphic Address,* 'THE BUILDER,' LONDON.

**CHARGES FOR ADVERTISEMENTS.**

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c., may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Postal Orders, payable to DOUGLAS FOURDRINIER, and addressed to the Publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Front Page should be in by TWELVE noon on WEDNESDAY.

**SPECIAL.**—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office, 46,* Catherine-street, Covent Garden, W.C. *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

**READING CASES,** { NINEPENCE EACH. By Post (carefully packed) 1s.


W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

HIGH-CLASS JOINERY,
LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

CONSERVATORIES,
GREENHOUSES,
WOODEN BUILDINGS,
Bank, Office, & Shop Fittings.
CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.


SUBSCRIBERS in LONDON and the SUBURBS, (by prepaying at the Publishing Office, 19s. per annum or 4s. 9d. per quarter), can ensure receiving "The Builder," by *Friday Morning's Post.*

## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.


THE BATH STONE FIRMS, Ltd.
BATH,
FOR ALL THE PROVED KINDS OF
BATH STONE.
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE.
DOULTING STONE.
The Ham Hill and Doulting Stone Co.
(incorporating The Ham Hill Stone Co. and C. Trask & Sons, The Doulting Stone Co.).
Chief Office:—Norton, Stoke-under-Ham, Somerset.
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand,

A TEST OF OVER FORTY YEARS has proved that
SZERELMEY STONE LIQUID
Absolutely waterproofs and preserves Bricks, Stone, Cement, Stucco, Plaster, &c.
SZERELMEY & Co., Rotherhithe New-road, S.E.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

SPRAGUE & CO.,
PHOTOLITHOGRAPHERS,
4 & 5, East Harding-street,
Fetter-lane, E.C. [ADVT.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.
METCHIM & SON, 20, Parliament-st. S.W.
"QUANTITY SURVEYORS' TABLES,"
For 1897, price 6d. post 7d. In leather 1/- Post 1½ [ADVT

PILKINGTON & CO
(ESTABLISHED 1838),
MONUMENT CHAMBERS,
KING WILLIAM STREET, LONDON, E.C.

*Registered Trade Mark.*
Poloncean Asphalte.

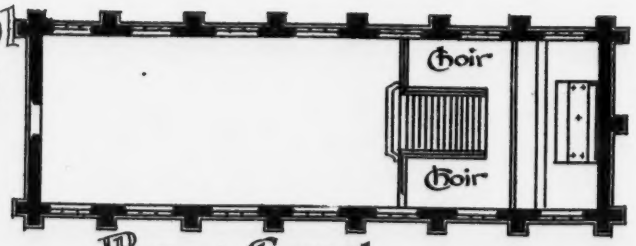
PATENT ASPHALTE and FELT ROOFING.
ACID-RESISTING ASPHALTE.
WHITE SILICA PAVING
SEYSSEL ASPHALTE.

ERNEST MATHEWS & CO. 61, ST. MARY AXE, LONDON, E.C.

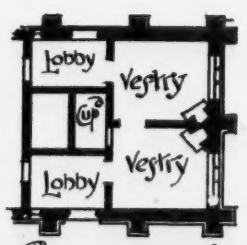
CONTRACTORS TO H.M. GOVERNMENT FOR SLATES AND SLATE BATHS.
PERMANENT GREEN SLATES, AS USED ON THE LAW COURTS AND OTHER PUBLIC BUILDINGS.
ROOFING SLATES OF EVERY DESCRIPTION. | SLATE SLABWORK OF EVERY DESCRIPTION, PLAIN AND ENAMELLED
MARBLE & ENAMELLED SLATE CHIMNEY-PIECES,
Marble and Enamelled Slate Lavatory Tops and Fittings complete, Slate Cisterns, Shelves, and Urinals.
Works—Aberllefenny, North Wales. Midland Wharf, Bow. Payne-road Wharf, Bow.
Head Office and only City Address, 61, ST. MARY AXE, E.C. Branch House, 37, Victoria-street, Bristol.
SEND FOR ILLUSTRATED PRICE LIST.

PHOTO-LITHO. SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE. E.C.

# Design for Chapel. Berkhamsted School (King Edward the VI^th^)




Plan of Chapel.




Plan of Vestries beneath Choir.

Scale of Feet

10 5 0 10 20 30 40 50 60 70 80 feet

Messrs Batterbury & Huxley
Architects.
29 John Street.
Bedford Row.
W.C.

GENERAL LIBRARY,
UNIV. OF MICH.
26 FEB 1897

HOUSE AT HEADINGLEY, LEEDS.—Mr. F. W. Bedford, A.R.I.B.A., Architect.

THE BUILDER, FEBRUARY 13, 1897.

HOUSE AT HEADINGLEY, LEEDS.—Mr. F. W. Bedford, A.R.I.B.A., Architect.



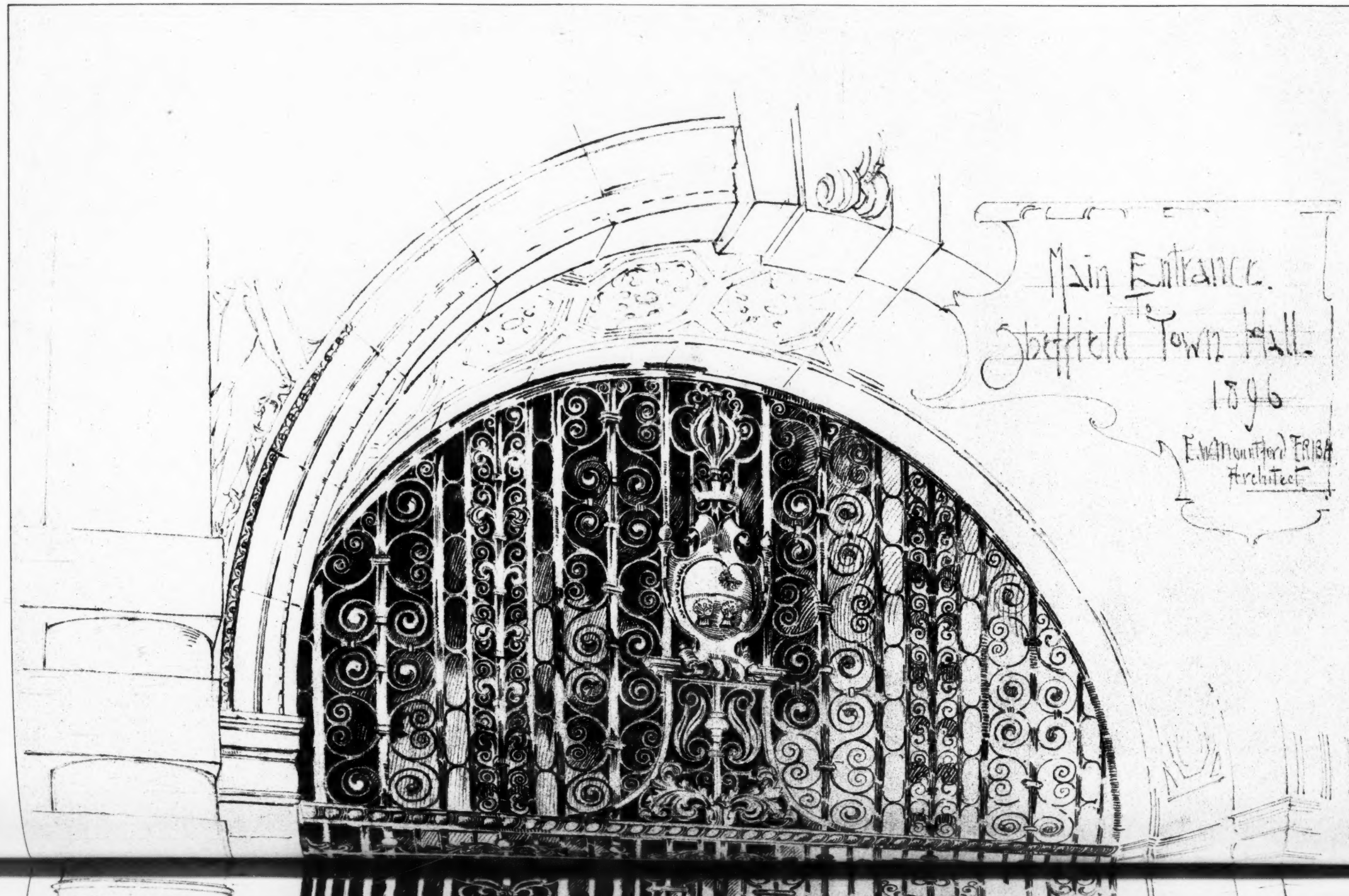
GENERAL LIBRARY,
UNIV. OF MICH.
26 FEB 1897

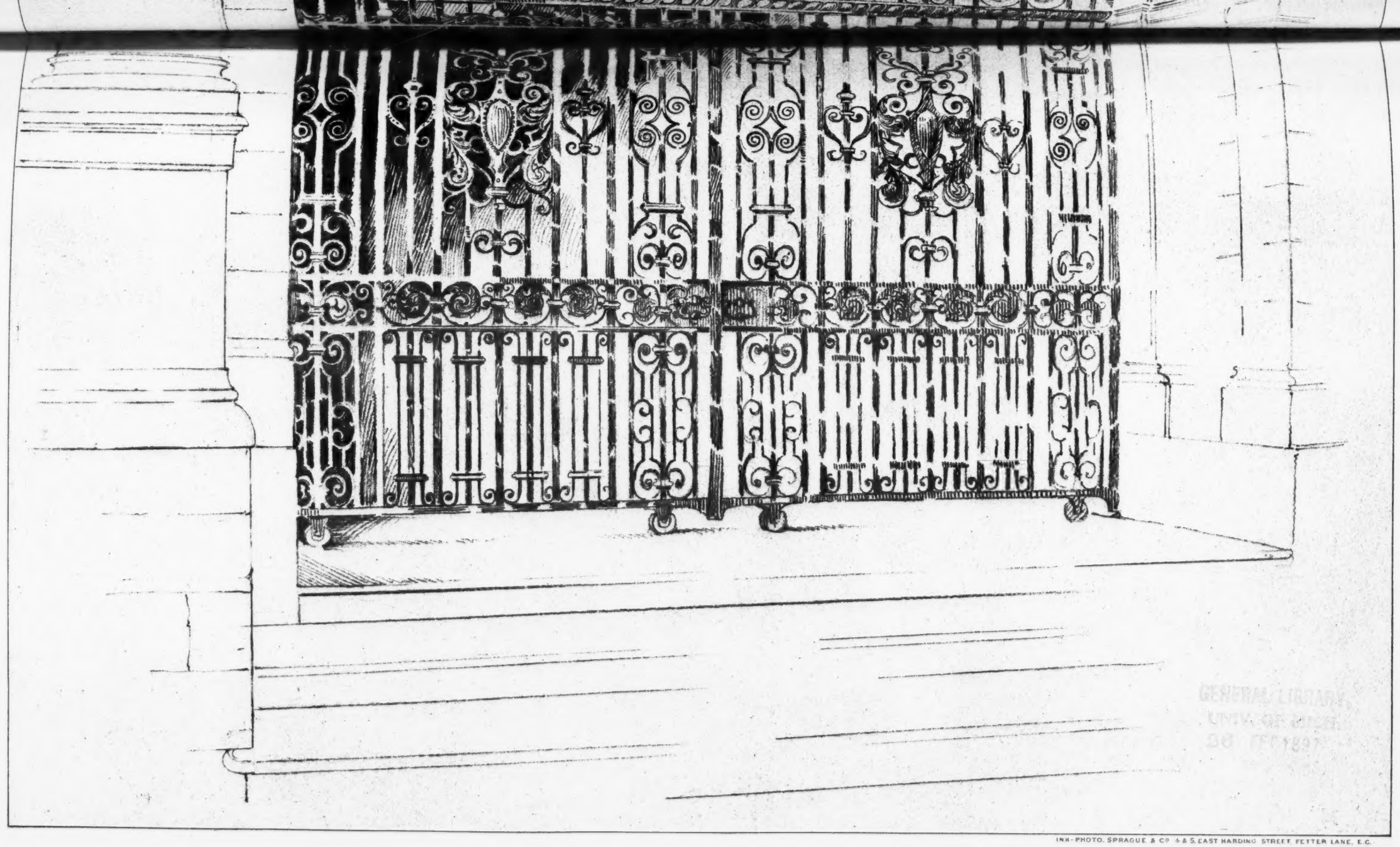
WORDSWORTH BUILDING, LADY MARGARET HALL, OXFORD.—Mr. Reginald Blomfield, M.A., Architect.

INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

NEW PREMISES, DUKE STREET, GROSVENOR SQUARE, W.—Mr. W. D. Caröe, F.R.I.B.A., Architect.

GENERAL LIBRARY,


Main Entrance.
Sheffield Town Hall.
1896
E. W. Mountford F.R.I.B.A.
Architect



GENERAL LIBRARY,
UNIV. OF MICH.
26 FEB 1897

INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

WROUGHT-IRON GATES, SHEFFIELD TOWN HALL.—Designed by Mr. E. W. Mountford, F.R.I.B.A.
Executed by Messrs. Singer & Co.